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UNDULANT FEVER.

WILSON (G. S.). **The Diagnosis of Undulant Fever.**—*Brit. Med. Jl.* 1930. Oct. 25. pp. 679–681. [14 refs.] [Summary appears also in *Bulletin of Hygiene.*]

The author discusses the various methods that are available for the diagnosis of *Br. abortus* infections in man, and the significance which should be attached to the results obtained. As regards the agglutination test, he considers that the occurrence of non-specific agglutination has been considerably overestimated. He concludes that agglutination to a titre of 1 : 10–1 : 80, in the absence of clinical symptoms, is probably indicative of past infection with an organism of the Brucella group; that a titre of 1 : 100 or over, in the absence of clinical symptoms, probably indicates a latent infection or repeated past infections; that a titre of 1 : 100 or over, in the presence of pyrexia and other symptoms of disease, may be considered as practically diagnostic of active infection with an organism of the Brucella group; and that a titre of 1 : 20–1 : 100, in the presence of the clinical signs of undulant fever, may likewise be considered as practically diagnostic of active infection.

He emphasizes the importance of making every effort to confirm the diagnosis by the isolation of the organism from the patient's blood, but notes that this method is by no means always successful.

Finally he considers briefly the possible usefulness of cultures taken from the urine or faeces, of animal inoculation, and of the diagnostic intradermal reaction.

W. W. C. Topley.

RODENWALDT (E. R. K.) & COHEN (A. J.). Febris undulans (Maltakoorts) in Ned.-Indië. [**Undulant Fever in Dutch East Indies.**]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1930. July 1. Vol. 70. No. 7. pp. 629–651. With 5 charts on 2 folding plates. [14 refs.]

After a full description of the disease (new in Dutch East Indies) containing no novel features, four cases of febris undulans are quoted which occurred round Malang (East Java). In a footnote two more cases from the same district are mentioned and one from Semarang. The cases presented nothing unusual. The diagnosis was made by agglutination against *Br. abortus*, or against *Br. melitensis*. The lowest titre regarded as significant for diagnosis was 1 : 200.

Epidemiological research yielded no clear results. The diagnosis is generally made in the later stages of the disease so that the source

is difficult to trace. The fact that infectious abortion of cattle has been noticed occasionally in the D.E.I. whilst no infection with *Br. melitensis* is known to the veterinary surgeons, together with the rarity of the disease in man (though goat's milk is often taken by the population) renders it most probable that Bang's bacillus is the causative agent.

W. J. Bais.

Löffler (W.) & v. Albertini (A.). Pathologisch-anatomische Befunde bei sog. Febris undulans des Menschen. [**Pathological Findings in a Case of Suspected Undulant Fever.**]—*Krankheitsforschung.* Leipzig. 1930. Jan. Vol. 8. No. 1. pp. 1–16. With 8 figs. (7 coloured) on 4 plates. [7 refs.] [Med. Polyclinic, & Path. Anat. Inst., Zurich.]

The report of a case of intermittent and remittent fever in a farmer aged 32. The principal feature, apart from fever, was the presence of a markedly enlarged spleen. Various diagnoses were suggested, such as tuberculosis, leukaemia, Banti's disease, splenic anaemia. Finally, in view of the progressive weakness, anaemia and continued fever, the spleen was removed. At the operation a small portion of the liver was obtained for examination. A very careful examination (histological) of sections of the spleen and liver was made, but no definite diagnosis was arrived at. The patient made an excellent recovery, the fever ceased, and he was able to return to his work in a few weeks.

In view of a possible diagnosis of leukaemia, periodical blood counts were carried out for a period of two years—up to 1929. During this time a series of cases of undulant fever was met with by the authors, and in view of the clinical similarity to these cases the blood of this patient was tested a year and four months after the operation and was found to agglutinate *Br. abortus* in a dilution of 1/30, the complement fixation test also being positive. A retrospective diagnosis of undulant fever was therefore made and the present paper published.

The principal changes noted are well illustrated by excellent coloured plates. The picture demonstrated by histological examination in this case is compared with that found in Banti's disease, which it closely resembled.

In view of the rarity of such an opportunity as occurred in this case for examination of the spleen—removed actually during the course of the fever—this paper is well worthy of study.

D. Harvey.

Bevan (Ll. E. W.). **Notes on a Case of Rhodesian Undulant Fever.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1930. June 30. Vol. 24. No. 1. pp. 93–95.

An account of a very prolonged case of Rhodesian undulant fever (*abortus*). The interesting feature was the presence of blood in involuntary seminal emissions, which continued for nine months, and pointed to an infection of the vesiculae seminales. A similar condition in bulls infected with *Br. abortus* has been described.

D. H.

Broc & Bonan (H.). Fièvre de Malte à forme délirante. [**Undulant Fever with Delirium.**]—*Tunisie Méd.* 1930. Feb. Vol. 24. No. 2. pp. 43–45.

A woman of 21 years fell sick with slight fever, sore throat and enlarged tonsils. On the fourth day she had a rigor, followed by a sharp rise of temperature, with severe headache and pains in the limbs. A septicaemic condition was diagnosed, but blood culture was negative. On the eighth day the temperature fell to normal, but the patient's condition was grave,

with rapid pulse and extreme prostration. The following day she became delirious, remained so for about eight days without cessation day or night and refused all nourishment. She eventually made a good recovery, but had a relapse of fever one month later.

The diagnosis was confirmed by a positive agglutination test in a dilution of 1/200 on two occasions; the intradermal reaction of Burnet was also positive.

D. H.

Paviot (J.), Martin (Joseph F.) & Dechaume (J.). Cellulite et myosite dans la fièvre de Malte. Etude anatomo-clinique. [**Case of Cellulitis and Myositis in Undulant Fever.**]—*Jl. Méd. de Lyon.* 1930. Feb. 5. No. 242. pp. 87–93. With 5 figs. [4 refs.]

The authors describe a case of undulant fever in a man aged 42. The patient had severe pains in the legs and muscles elsewhere. Following on complaint of pain in the lower abdomen a tense, painful and tender swelling was discovered just above the pubes and apparently in the sheath of the rectus muscle. Incision gave exit to some oedematous fluid; there was no pus. With a view to determine the nature of the swelling and to obtain an explanation of the pain in this region and elsewhere a piece of tissue was excised, and sections were stained and examined. Four figures are given showing the condition present, which was due not to any cellular or inflammatory invasion but to effusion of plasma between the cells and separating the muscle bundles, involving nerves and causing the pain. In some of the sections formation of young fibrous tissue can be seen and also some new elastic tissue. The condition apparently clears up or may leave small fibrous nodules in the subcutaneous tissue. The authors consider that this effusion of plasma accounts for the pains in the muscles frequently complained of in this disease and especially in the muscle sheaths close to the joints. There is no question of an inflammatory condition.

D. H.

Malaguti (Antonio). Nuovi focolai de febbre ondulante in Romagna. [**Fresh Foci of Undulant Fever in Romagna.**]—*Giorn. di Clin. Med.* 1930. Apr. 10. Vol. 11. No. 5. pp. 311–330. [18 refs.]

Three typical cases of undulant fever of average severity are described. The diagnosis was made by agglutination, the serum giving a positive with both *Br. melitensis* and *Br. abortus* in equal titre in the first two, higher with *Br. abortus* in the third. They came from two districts in Forli Province where cases had not previously been recorded.

H. H. S.

Dubois (Charles) & Sollier (Noel). La vaccination préventive de l'homme contre le " Melitensis " paraît être une nécessité dans les milieux infectés de mélitococcie animale. [**Need for Protective Inoculation of Man against Undulant Fever in Foci of Animal Infection.**]—*Bull. Acad. Méd.* 1930. Apr. 1. 3rd Ser. Vol. 103. No. 13. pp. 319–328. [6 refs.]

The problem of undulant fever is a grave one in the south of France. Several thousand cases occur every year. The disease is also common in domestic animals, especially in sheep and goats. The suggestion has been made to attack the disease by the vaccination of these animals, but unfortunately an efficient vaccine is still to seek. As regards the people engaged in farming and dealing directly with these infected animals, hygienic measures alone have failed to protect. It is suggested, therefore, that they be protected by

vaccination. That such protection is possible has already been shown by NICOLLE, CONSEIL and BURNET, who used a heat-killed vaccine of *melitensis*, given in two doses of 700 million bacteria at 7-day intervals. Laboratory workers have been protected in the same way. For those who do not come directly into contact with animals, boiling of milk may be sufficient.

The authors give an interesting account of an outbreak of undulant fever on a sheep farm; no cases of abortion had occcurred among the flock, but a new shepherd arrived who was recently convalescent from undulant fever; a few months later 40 cases of abortion occurred among the flock and four cases of undulant fever among the workers on the farm. The remaining 18 people were inoculated in two doses with a heat-killed vaccine containing 2,000 million bacteria in 1 cc., the first dose being ¼ or ½ and the second 1 cc.

The authors strongly urge the necessity of preventive inoculation of all the people " dans les foyers de melitococcie animal."

D. H.

ZAMMIT (Themistokles) & DEBONO (J. E.). **Immunisation of the Maltese Goat by Means of Cutaneous Vaccination.**—*Lancet.* 1930. June 21. pp. 1343–1344. [Public Health Dept., Valetta.]

Following on the lines suggested by BESREDKA's work the authors employed dermal immunization against *melitensis* infection in goats. A filtrate of a broth culture of *melitensis* was sprayed over the mammary region and into the mouth, and 1 cc. was injected intradermally in four places. The treatment was repeated four times on alternate days. No agglutinins appeared in the blood. Two days after the last dose all the treated goats and a control were inoculated subcutaneously with 1 cc. of a living broth culture containing 3,000 million organisms. Fever appeared in the control on the fourth day and agglutinins were demonstrated in the blood of all the animals. On the eighth day numerous organisms (*melitensis*) were demonstrated in the milk of the control goat, but none were found in the milk of any of the inoculated goats. All goats were killed six weeks later. In two of the inoculated animals all cultures were sterile; three showed a light infection in glands and kidney. The control goat was heavily infected, infection including the mammary gland, which was spared in inoculated animals.

A second series was employed, using a similar technique, but with a formolized broth culture. The results were similar. In four out of twelve inoculated animals there was no trace of infection, and in none was the mammary gland infected.

The authors consider these results very hopeful and are continuing their investigations with a view to the inoculation of the local Maltese goats.

D. H.

CERRUTI (Carlo). Sulla vaccinazione delle capre contro l'infezione da *Br. melitensis* con vaccini formolati. (Nota preventiva.) [**Prophylaxis of** *Brucella melitensis* **Infection in Goats by means of Formolized Vaccine.**]—*Arch. Ital. Sci. Med. Colon.* 1930. May 1. Vol. 11. No. 5. pp. 257–262. English summary (7 lines). [16 refs.]

The work described was carried out in Cagliari (Sardinia) where a large proportion of goats and sheep is infected. The animals appear

fat and well and produce plenty of milk. Abortion, however, is very common, up to 90 per cent. and even higher, and the young die from the infection in large numbers 1–2 months after birth. The author used for vaccine a 7-day broth culture, to which was then added 0·3 per cent. formol. The mixture, after being left at 37° C. for 5 days with frequent shaking, was placed in vials ready for use. Three doses each of 5 cc. were injected at 10–12 days intervals. For the first a human strain was used, for the others a strain isolated from an infected animal.

Prior to starting the vaccination the rate of abortion was 32 per cent. (80 out of 250); 230 were given the full course and only 3 aborted (1·3 per cent.); 20 received one dose only, and 8 of these aborted. None of the young died from infection. If, as the result, the goats cease to excrete the organisms a marked reduction in human cases will follow.

H. H. S.

Marshall (M. S.) & Jared (Dorothy). **Bacteriostatic Action of Dyes on the Organisms of Undulant Fever.**—*Proc. Soc. Experim. Biol. & Med.* 1930. Mar. Vol. 27. No. 6. pp. 525–527. [1 ref.] [Med. School, Univ. of California, San Francisco.]

It has been stated that the inhibitory action of certain dyes can be relied on as one means of differentiating between the caprine, bovine and porcine strains of Brucella. But even those who claim most for this method allow that there are discrepancies. The authors carried out some tests to explain, if possible, these discrepancies. The method was to incorporate varying dilutions of dyes in melted liver hormone agar, and to plant out the strains under test on plates formed from this medium. The inoculum was as nearly as possible the same in amount in each case, an important point, for it was found that by varying the amount of inoculum discrepancies resulted. It was noted also that on occasion a strain might grow in agar with gentian violet in a dilution of 1 : 50,000, but was inhibited on a plate with one-fifth less of the dye. Other dyes gave the same irregular results. Four samples of thionin obtained from different sources gave entirely different results with the same strain of Brucella. It was also noted that the rough variant of a strain was definitely more resistant to the action of dyes than the smooth variant.

It is obvious that the action of dyes cannot be relied upon as a means of differentiating various strains, although in some instances confirmatory evidence may be obtained.

D. H.

Amoss (Harold L.) & Poston (Mary A.). **Cultivation of Brucella from the Stools and Bile : Further Observations.**—*Jl. Amer. Med. Assoc.* 1930. Aug. 16. Vol. 95. No. 7. pp. 482–483. [4 refs.] [Med. Clinic, Johns Hopkins Univ. & Hosp., Baltimore.] [Summary appears also in *Bulletin of Hygiene.*]

Organisms of the Brucella group were isolated from stools by the following technique. The stool suspension is treated with immune serum to clump any organisms present, and the sediment produced by differential centrifugation is seeded on to Teague medium. (Meat extract agar 100 cc. at pH 7·4 to which is added, while melted, 5 cc. each of a 20 per cent. solution of sucrose and lactose, 1 cc. of a 4 per cent.

aqueous solution of yellow eosin and 1 cc. of a 1 per cent. aqueous solution of methylene blue.) Two plates are incubated in air and 2 in 10 per cent. CO_2.

Organisms of the Brucella group were obtained 78 times from the stools of six patients, whereas another patient, with positive blood culture and a mild type of infection, gave stools which yielded no Brucella in 12 examinations. In one of the six, Brucella was isolated from the fluid obtained by duodenal drainage before operation and from the gall bladder contents at operation.

As far as the authors' experience goes, the substitution of Huddleson's liver agar, pH 6·6, as a basis, for their meat extract [it is not stated whether the sugars and dyes were the same in both media] in no way improves the rate of growth of the organism, and gave exactly similar results in a series of 10 stools tested in parallel series with meat extract agar.

A. A. Miles.

NEIVA (Cicero). Agglutininas para *Brucella abortus* em sôros humanos. [**Agglutination of** *Brucella abortus* **by Human Sera.**]—*Rev. Soc. Paulista Med. Vet.* São Paulo. 1930. Mar.–Apr. Vol. 1. No. 3. pp. 73–80. [50 refs.] English summary. [Butantan Inst., Butantan.]

In 1928 the author tested the sera from 176 cattle in S. Paulo and found that 18 agglutinated *Br. abortus*. He then examined 221 specimens from human subjects sent to the Bacteriological Institute, Butantan, for the Wassermann and other serum tests, to determine the agglutination reaction, using two strains of the organism of bovine origin, one from the laboratory at Buenos Aires, the other from Alfort, France. One of the sera gave a positive when diluted 1 in 160 and two at 1 in 320. Several agglutinated at titres below this, but were not regarded as positive. All these were from Japanese recently arrived in the country. Blood cultures were attempted from 39 individuals but all were negative. To avoid conveyance of the disease by milk, all the milk is now pasteurized before distribution.

H. H. S.

DENGUE AND PAPPATACI FEVER.

BLANC (Georges) & CAMINOPETROS (J.). Recherches expérimentales sur la dengue. [**Experimental Researches on Dengue.**]—*Ann. Inst. Pasteur.* 1930. Apr. Vol. 44. No. 4. pp. 367–436. With 12 text figs. [3 pages of refs.] [Hellenic Pasteur Inst., Athens.] Also in *Arch. Inst. Pasteur Hellénique.* 1930. Vol. 2. No. 2. pp. 199–276. With 12 text figs. [3 pages of refs.]

This long article gives an account of the experimental work carried out at the Pasteur Institute in Athens during the epidemic of dengue in that city during 1927–1928.

The new facts arising out of this work are given as follows :—

1. The serum of a dengue patient kept in the dark in sealed tubes at room temperature will retain its virulence for at least fifty-four days.

2. Man may suffer from an attack of inapparent dengue. During such an attack the blood is virulent and immunity follows.

3. The guineapig if inoculated with virulent dengue blood is not affected, but five days later its blood can be shown to be virulent.

The results of this work have already been published in various articles, but in the paper under review are brought together in more detail. Reference is made to the history of dengue research. It is pointed out that on the work of GRAHAM it has been claimed that *Culex pipiens* may act as a carrier of the disease. What GRAHAM actually did in 1907 at Beirut was to collect a mixed bag of mosquitoes in the room of a person suffering from dengue, and convey these to a village many miles away where he persuaded two volunteers to release the mosquitoes inside their mosquito nets. Both the men contracted dengue a few days later. No one else in the village contracted dengue. GRAHAM did not state that the mosquitoes he used were *pipiens*, but that both *Culex pipiens* and Stegomyia were present in the room.

American workers, in 1924, showed that *Culex fatigans* is not capable of conveying the disease which is readily transmitted by *Aedes aegypti* (Stegomyia). The authors worked with this species in Greece, and a very elaborate account of the methods they adopted in keeping and breeding the insect is given ; this chapter is fully illustrated.

Mosquitoes captured in Athens and kept in captivity in the laboratory remained alive from October 9th to May 25th, or 228 days. (Some mosquitoes bred in the laboratory lived for 186 days.) The mosquitoes were fed regularly on human blood and laid numerous eggs.

Transmission experiments are described and full protocols given. In one interesting experiment two batches of mosquitoes were employed, one of Stegomyia and one of *Culex pipiens*. These mosquitoes had been fed on the same dengue patient and kept at a temperature of 22° C., for ten days. The batches were then fed on healthy volunteers ; None of the eight volunteers on whom the *pipiens* fed suffered in any way, whereas the cage of Stegomyia infected eight out of eleven volunteers.

An interesting fact noted was that if the mosquitoes are kept at a temperature below 16° C. they do not become infective or if they are infective and are kept for a few days at, or below, this temperature, they loose their infectivity, but regain it again if the temperature is raised above this point.

The authors, as a result of their experiences, consider that mosquitoes do not become infective until eight days after the infecting feed. Mosquitoes once infective remain so for life provided the temperature does not fall below 22° C. for any prolonged period. The most favourable time to infect mosquitoes is in the first three days of the fever, but experiment showed that the blood may be infective as long as fever lasts. It was proved that the virus of dengue in the mosquito is readily filterable.

An account is then given of attempts by the authors to infect laboratory animals. The dog and the rabbit are insusceptible. The white rat may show the presence of the virus in the blood some days after inoculation, but it is not possible to say whether this is a true multiplication of the virus. Monkeys show a true, inapparent dengue. They suffer in no way and have no fever, but if the blood is taken daily up to the fifth day it can be shown to be inert, whereas from the fifth to the tenth day the monkeys' blood is infective for man, thus showing a true multiplication of the virus ; such monkeys can be shown to be immune to subsequent injection of virulent blood. It has also been found that in monkeys during the period when the blood is infective there is a remarkable alteration in the white cell count.

The authors are convinced that an attack of dengue confers a strong and lasting immunity although the serum of a convalescent has no inhibitory action when inoculated along with virus.

A chapter follows on the effects on the virus of heat, drying and various chemicals.

An account is also given of attempts to vaccinate against the disease by means of a mixture of bile and virus. This work has already been published and summarized [see this *Bulletin*, Vol. 27, p. 146]. Here it is noted that by means of a double inoculation, a first dose of 1/12 dilution of bile followed by a dose of 1/20 dilution (in the latter the virus is still active) immunity against inoculation with virulent blood is obtained.

D. Harvey.

CHOREMIS (K.). Denguefieber im Kindesalter. [**Dengue in Childhood.**] —*Jahrb. f. Kinderheilk.* 1930. Mar. Vol. 127. No. 1/2. pp. 104–109.

It has generally been stated, the author remarks, that young children strongly resist dengue infection. In the first year of the outbreak in Greece this opinion was confirmed, but when in 1928 the disease became pandemic very many children became infected. The author saw many cases. In very young children the alimentary system was principally attacked, and in many cases a condition resembling dysentery developed, with a maximum of seven or eight motions in the day. The fever as a rule remained high and fell by crisis ; prolonged fever noted in older children did not occur in children in arms. Vomiting also was very common, and was often intractable. The eruption in small children was seldom typical, resembling a measles eruption and occasionally urticaria.

It is generally stated that in dengue there is leucopenia, but in small children leucocytosis is more common. No deaths were noted in babies, even in those with severe enterocolitis. Bleeding from the mucous membranes of the nose and mouth was fairly common and in one case, a girl of eleven years, nearly proved fatal. Treatment was symptomatic

and attention to nourishment was most important. Yatren was tried in cases of enterocolitis.

D. H.

Avaritsiotis. Sur le neurotropisme de la dengue. [**Neurotropism in Dengue.**]—*Bull. et Mém. Soc. Méd. Hôpit. de Paris.* 1930. Mar. 24. Year 46. 3rd Ser. No. 10. pp. 441–444.

The author records the following as being due to the nerve toxin of dengue.

1. Influence on the central nervous system; this accounts for hypotension, fatigue, psycho-neuroses, etc.
2. Action on the peripheral nerves; neuritis, spasms, paralysis, itchings.
3. On the vaso-motor system; causing visceral congestion, haemorrhages, enlargement of spleen, liver and kidneys.

The author points out that nervous complications may follow an attack of dengue, e.g., neuralgia, and may persist for many weeks; the slow pulse rate may also continue long after the temperature has fallen to normal.

D. H.

Tsiminakis (Konstantin). Dengue-Epilepsie. [**Epilepsy in Dengue.**]—*Wien. Klin. Woch.* 1930. June 12. Vol. 43. No. 24. p. 755.

It was generally agreed during the epidemic of dengue in Athens that the virus was neurotropic, acting in some cases on the peripheral and in others on the central nervous system. The author himself observed three cases of epilepsy, following attacks of dengue at varying intervals. All three were in young people, aged 18, 22 and 22 years respectively, and in none was there any evidence of fits prior to the attack. The attacks were similar in all; they commenced with giddiness and tremor of the whole body, and were followed by loss of consciousness, with generalized muscular spasms; sleep followed and on awaking pains in the head and extreme exhaustion were complained of.

The author compares these cases with similar cases which he has seen following encephalitis.

D. H.

Medulla (Candido). Casi sporadici di dengue in Marmarica. (Nota epidemiologica.) [**Sporadic Cases of Dengue in Marmarica.**]—*Arch. Ital. Sci. Med. Colon.* 1930. Apr. 1. Vol. 11. No. 4. pp. 236–238. [13 refs.] English summary (6 lines) p. 239.

A few (10–12) patients presented themselves at the Hospital with a rash and slight rise of temperature in June, 1929, and from their histories and the course of the illness, the condition was diagnosed as dengue. They came from the interior of Marmarica (Cyrenaica). In addition, two Europeans were attacked; their cases are described and were typical. Search for mosquito larvae resulted in the discovery of Aëdes and Culex in small collections of water near the new hospital.

H. H. S.

Cazanove (F.). Dengue et fièvre jaune. [**Dengue and Yellow Fever.**]—*Bull. Soc. Path. Exot.* 1930. Feb. 12. Vol. 23. No. 2. pp. 155–159.

Discusses the occurrence of these diseases in Senegal and suggests that the appearance of dengue should be regarded as an alarm signal showing that the danger limit of Stegomyia infestation has been reached.

D. H.

PETROV (V. P.). [**Epidemiology of Pappataci Fever in connexion with the Biology of Sandflies.**]—*Pensee Méd. d' Usbékistane et de Turqumenistane.* Tashkent. 1929/30. No. 1. pp. 1–16. [In Russian.]

The greater part of the paper is devoted to a review of previous data on the bionomics of sand flies in connexion with the epidemiology of pappataci fever. A brief account is given of the conditions which obtain in Middle Asia. This region has a typical continental climate with sharp daily and seasonal fluctuations of temperature. In summer (June, July, August) it is very hot, the temperature reaching 40–50° C. in the shade, while on the surface of the earth it may be as high as 70° C. In winter the temperature may fall as low as —28° C. The country is very arid owing to excessive evaporation brought about by low atmospheric pressure (716–728) and constant winds. The climatic conditions in Middle Asia thus appear to be unsuitable for the development of sand flies. However, a well developed system of irrigation has created artificial oases in towns and settlements, and since the sanitation in such towns is very unsatisfactory and the dwellings are of a type that affords good shelter to all kinds of insects, such places provide excellent breeding grounds for sand flies.

In Tashkent sand flies first leave their hibernating quarters in the middle of May; their number diminishes during the second half of June, in July and at the beginning of August, during which period the insect breeds and undergoes its metamorphosis. At the end of this period there is a considerable increase in their number. It was observed that the incidence of pappataci fever corresponds closely with the two periods of maximum increase in the number of sand flies. Variations in the meteorological conditions affecting the course of development of the insect influence the time at which the two peaks of the curve of incidence occur.

C. A. Hoare.

APOSTOLOPOULOS (Konst. G.). Das Dengue-Fieber in Athen im Herbst 1928. —*Muench. Med. Woch.* 1930. Feb. 14. Vol. 77. No. 7. pp. 265–268. With 2 charts in text. [2 refs.]

UNCLASSED FEVERS.

FLETCHER (William). **Typhus-like Fevers of Unknown Aetiology, with Special Reference to the Malay States.**—*Proc. Roy. Soc. Med.* 1930. May. Vol. 23. No. 7. pp. 1021–1027 (Sect. Epidemiol. & State Med. pp. 37–43). [30 refs.]

This paper is concerned with the typhus-like fevers transmitted by unknown vectors. Clinically these cases resemble real typhus very closely, but as a rule run a milder course. They are non-contagious. Health authorities are unanimous that they are not true typhus and that they are not a menace to public health.

These fevers fall into two groups, a rural and an urban. The rural group includes tick typhus of India and scrub typhus of Malaya. The urban group includes Brill's disease, endemic typhus of Australia, and shop typhus of Malaya. The disease in the rural group is apparently carried by ticks or mites. The vector for the urban group has not yet been determined.

The Weil Felix Reaction. The reaction in Malaya is positive in the urban group, but negative in the rural group when the ordinary X19 strain of Proteus is employed, but if a non-indologenic strain labelled " Kingsbury " is employed scrub typhus also gives a positive reaction.

Epidemiology. The urban form occurs sporadically all over the country but especially among people who are employed in grain shops. It is suggested that rats are the carriers and fleas the vectors. The rural form is a disease of open country, and occurs principally among coolies employed on the estates and especially those engaged in clearing scrub on old plantations. Rats are numerous, and large numbers of mites are found on them. It is possible that this disease like tsutsugamushi disease is conveyed by a mite.

In the discussion which followed, Dr. FELIX expressed the opinion that the K. strain of Proteus was really similar to X2, a strain which had been employed along with X19, of which it was a variant.

D. Harvey.

ANIGSTEIN (Ludwik). **Studies on Tropical Typhus in British Malaya. (Preliminary Note.)**—*Malayan Med. Jl.* 1930. June. Vol. 5. No. 2. pp. 62–64. [9 refs.] [Inst. for Med. Research, Kuala Lumpur, F.M.S.]

This is an account of some laboratory investigations into tropical typhus among Tamil coolies in Malaya, on the lines of similar work carried out by the author and others in Europe. Forty-eight cases were examined bacteriologically, all of which were similar clinically to cases described by FLETCHER. The Weil-Felix reaction was positive, in all but one with the Kingsbury strain of proteus ; these were rural cases. The one case gave a positive reaction with the Warsaw strain and was an urban case.

Of two hundred guineapigs injected with human virus, 11 per cent. reacted, with fever, cachexia and death in one or two instances. Swelling of the scrotum was also sometimes noted. Post-mortem examination of these animals showed, in the majority of males, lesions of the testicles characterized by haemorrhagic exudate into the fatty tissues. Microscopic examination of smears from the tunica vaginalis showed numerous spindle-shaped, Gram-negative organisms resembling those already described in Mexican and European typhus. Examination of the brains of guineapigs revealed changes recognized as typical of typhus, i.e., perivascular infiltration and the presence of nodules consisting of mononuclear and glia cells.

Rats inoculated with human virus showed occasionally intermittent fever, with swelling of the scrotum, similar to that in guineapigs. The serum of some of these animals gave also a positive Weil-Felix reaction with the Kingsbury strain. Sixteen out of eighty rats inoculated with brain of guineapigs which had had no fever, but showed loss of weight and cachexia following inoculation with human virus, gave positive Weil-Felix reactions.

Wild rats collected in the district showed in some instances positive Weil-Felix reaction and swelling of the scrotum.

Pleomorphic bacterial organisms obtained in pure culture from blood and brain of human cases, when inoculated into rabbits and rats, produced a positive Weil-Felix reaction, and also typical lesions in guineapigs.

D. H.

Toullec (F.). Essai nosographique des fièvres typho-exanthématiques. [**Classification of Typhus-like Fevers.**]—*Bull. Soc. Path. Exot.* 1930. Feb. 12. Vol. 23. No. 2. pp. 152–153. [School of the Colonial Health Service, Marseilles.]

The author refers to the confusion at present existing in the classification of the typhus-like fevers. He suggests that although the etiological factors and the vectors may be different, yet these diseases may be grouped clinically under a definite group of symptoms, the three salient features being: (1) The temperature curve. (2) The rash. (3) The typhoid state of variable intensity.

Clinically such fevers as true typhus, Rocky mountain fever, the river fever of Japan, tropical typhus, all come under this syndrome, slight variations being due to the varying intermediate hosts.

The author suggests classification into two groups only.

(1) Exanthematous fever due to lice.

(2) Exanthematous fever due to ticks.

He supports his views by the statement that in typhus carried by lice the Weil-Felix reaction is positive, whereas in typhus carried by ticks this reaction is negative. [In view of the work of Fletcher in Malaya and others this statement is hardly accurate, since with the use of certain strains of proteus positive reactions have been obtained in tropical typhus.]

D. H.

Peverelli (P.). De Proteus X 19-reactie volgens Weil-Felix. [**The Proteus X 19-Reaction according to Weil-Felix.**]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1930. May 1. Vol. 70. No. 5. pp. 436–443. [3 refs.]

The author examined 2,250 sera by means of the Weil-Felix test. The sera were partly samples sent in for the Wassermann reaction. A positive Weil-Felix test (1/200 and higher) was found in 29 cases (1·28 per cent.). Dividing the patients into those with and those without fever, in the former group 11·9 per cent. gave a positive result, in the latter, which may be regarded as controls, 0·57 per cent. Seventeen histories of patients are briefly quoted; many of them showed a positive test in high dilution. The results indicate that it is worth while to pay attention to the possible occurrence of "tropical typhus" in the D.E.I. Caution has to be taken in interpreting the results of the test, which should be repeated with different strains of proteus in various stages of the disease.

W. J. Bais.

Castaneda (M. Ruiz) & Zinsser (Hans). **Studies on Typhus Fever. III. Studies of Lice and Bedbugs** (*Cimex lectularius*) **with Mexican Typhus Fever Virus.**—*Jl. Experim. Med.* 1930. Nov. 1. Vol. 52. No. 5. pp. 661–668. With 2 charts in text. [4 refs.] [Med. School, Harvard Univ., Boston.] [Summary appears also in *Bulletin of Hygiene.*]

The authors describe a series of experiments on lice which demonstrate that, under favourable conditions, the Rickettsiae present in the organs of guineapigs infected with Mexican typhus can be carried for 10 days in these insects, and that a ground-up suspension of such lice is still

capable of infecting normal guineapigs, with a typical febrile reaction and the appearance of Rickettsiae in the tunica. In other words, the Rickettsiae behave, in regard to the louse, as we should expect them to behave if they were the actual infective organisms.

Experiments with the bedbug (*Cimex lectularius*) showed that Rickettsiae from guineapigs infected with Mexican typhus can survive in these insects after intra-coelomic injection for ten days, remaining capable of infection. Bedbugs may also be infected by allowing them to feed on benzolized rats, in whose blood Rickettsiae have been shown to be present. Attempts to infect normal guineapigs by allowing infected bedbugs to feed on them, or by rubbing the faeces into the uninjured skin, have so far been unsuccessful.

W. W. C. Topley.

Marcandier & Bideau. Note sur l'épidémiologie de la fièvre exanthématique observée à bord des navires de guerre à Toulon. Rôle possible d'un acarien du rat dans la transmission. [**Epidemiology of Eruptive Fever observed on Battle Ships at Toulon. Possible Rôle of a Rat Acarus in its Transmission.**]—*Rev. d' Hyg. et de Méd. Préventive.* 1930. May. Vol. 52. No. 5. pp. 353–364. With 2 text figs. [9 refs.] [St. Anne Hosp., Toulon.] [Summary appears also in *Bulletin of Hygiene.*]

The authors allude to the paper by Plazy, Marçon and Carboni (*Bull. of Hyg.*, Vol. 3, p. 623) on a mild disease occurring in the French Navy and resembling the exanthematous fever of the Mediterranean coast described by D. and J. Olmer, Boinet and Pieri, Dunan, Burnet, Durand and Conseil.

They now record their observations on 52 naval cases treated in land hospitals or in the sick bays on the ships and showing the following annual distribution :

1926	...	...	...	3 cases
1927	...	...	...	14 „
1928	...	...	...	16 „
1929	...	...	...	19 „

The cases were most frequent among the men on board ship and particularly in a certain group of ships, as is shown by the fact that 46 of the 52 cases were among men on board and only 6 among the land staff, and of the 46 cases on the ships 41 were found among the large vessels forming part of the French Mediterranean Squadron. Only a comparatively small proportion of the crew were affected, ranging from 4·5 per cent. in one ship to 14·1 in another. The majority of the cases (63 per cent.) occurred among the machinists and stokers, the provisioning department being next most affected, whereas the staff on the bridge almost entirely escaped. Up to the present the disease has only been observed in ships which have been fully manned and during the periods of active navigation. The greatest number of cases were seen during the months of July, August and September, the seasonal distribution corresponding with that of the Marseilles exanthematous fever, and the *fièvre boutonneuse* of Tunis described by Conseil, although, apart from the summer months, isolated cases occurred on board the ships fairly frequently throughout the year. The contagiousness of the disease was very slight or even nil, no definite case of

direct or indirect spread of the disease from man to man having been observed in the land hospitals or sick bays, in spite of the close contact in which the men live.

As regards the mode of transmission, the authors are inclined to regard a rat acarus, *Dermanyssus muris* (Hirst) as responsible for the following reasons :

(1) Rats and the incriminated parasite are most numerous in that part of the ship inhabited by the staff who are most affected by the disease.

(2) All the circumstances which facilitate and multiply the opportunities for contact between man on the one hand and rats and their parasites on the other favour the development of the disease.

(3) The disease is most frequent in the summer months when the parasites are most numerous.

(4) *Dermanyssus muris* was not found on the ships which remained immune from the disease.

J. D. Rolleston.

Durand (Paul) & Conseil (Ernest). Transmission expérimentale de la fièvre boutonneuse par *Rhipicephalus sanguineus*. [**Experimental Transmission of Fièvre Boutonneuse by** *R. sanguineus*.]—*C.R. Acad. Sci.* 1930. May 26. Vol. 190. No. 21. pp. 1244–1246.

The authors attempted to transmit the disease by the bite of the tick, using monkeys as experimental animals, but all results were negative, owing, it is suggested, to the difficulty experienced in making the ticks bite. Accordingly some experiments were carried out on healthy volunteers.

Fifteen cc. of blood from a case of fever, taken early in the disease, inoculated into two healthy volunteers gave negative results. Five cc. of the blood from a dog which lived in the house of the patient and was infested with ticks inoculated into two volunteers gave negative results. Fifteen Rhipicephalus ticks were removed from the dog, washed in sterile water, crushed up in saline, and the emulsion inoculated into two volunteers. In one case five days later, and in the other seven days later fever commenced, with headache, and two days later the characteristic eruption appeared. The fever ceased at the end of ten days in one case and thirteen days in the other.

The authors consider that this result incriminates this tick as a transmitter of the disease, the reservoir of the virus being in this case the dog.

D. H.

Jorge (Ricardo). La fièvre exanthématique (fièvre escharo-nodulaire) et son apparition au Portugal. [**Eruptive Fever and its Appearance in Portugal.**]—*Bull. Office Internat. d'Hyg. Publique.* 1930. May. Vol. 22. No. 5. pp. 908–926. With 1 map & 1 chart in text. [3 refs.]

In view of the nodular lenticular rash and the initial eschar, or ulcer, the author suggests the name " fièvre escharo-nodulaire," but Tunisian observers claim that this disease is the same as " fièvre boutonneuse " and that that name should have priority.

The first case seen in Lisbon, in August, 1929, was in a young woman. There was a marked " tache noire " on the neck at the site of an insect bite. The Weil-Felix reaction was negative and the disease clinically typical of the Marseilles fever. A second and similar case was

reported on September 2nd. The primary ulcer was on the forearm. In a third case also, reported on September 21st, the Weil-Felix reaction was negative.

Dr. REBELLO of Gonvera, a small industrial town in the mountainous district in the interior, had in the year 1927 noted several cases of the same disease. Typhus is endemic in this area : but the cases of the new fever were readily distinguished by reason of their mildness and non-contagious character. In 1928 REBELLO noted twelve cases and in 1929 another twelve. In six cases the Weil-Felix reaction was tested and found to be negative. Cases have also come to light elsewhere in Portugal and have been reported, too, in Spain.

There follows a detailed description of the clinical aspects of the disease taken from the literature (already summarized in this *Bulletin*). As regards the identity with typhus or Brill's disease, the author holds that neither on clinical, epidemiological, serological nor experimental grounds could such identity be maintained. It is noted that in all three Lisbon cases there was a history of a recent visit to the country where the patients had come into close contact with dogs infested with ticks.

The author suggests grouping these diseases as follows :—

1. Fever with macular rash, without papules or primary eschar and enlarged glands ; Weil-Felix reaction positive.
   - (*a*) Epidemic typhus.
   - (*b*) Brill's disease.
   - (*c*) Rocky Mountain fever.

2. Fever with maculo-papular rash, with primary ulcer and adenitis ; Weil-Felix reaction negative.
   - (*a*) Fièvre boutonneuse.
   - (*b*) Tsutsugamushi fever.
   - (*c*) Tick-bite fever of Africa.

D. H.

OLMER. La fièvre exanthématique. [**Eruptive Fever.**]—*Marseille-Méd.* 1930. Jan. 25. Vol. 67. No. 3. pp. 144–146.

The author points out that the disease is no longer confined to the suburbs of Marseilles, but has also been reported from Nice, Cannes, Toulon and other Mediterranean towns, as well as from Madrid, Lisbon, and Rome. He is of opinion that cases should not be published as of this disease unless inoculation of the blood of the patient has been made into a guineapig. Such inoculation is positive in typhus but negative in eruptive fever. This should be followed, where possible, by inoculation into monkeys if full scientific proof is required. The author stresses these points in view of the diffusion of the disease, and he evidently believes that cases are now being returned as eruptive fever which have been insufficiently investigated.

D. H.

MEDULLA (Candido). Sopra alcuni casi di forma morbosa riferibile alla febbre bottonosa di Tunisi (o febbre eruttiva del Carducci) osservati in Cirenaica. Contributo alla casistica ed all'epidemiologia. [**Cases of Eruptive Fever occurring in Cyrenaica.**]—*Riforma Med.* 1930. May 12. Vol. 46. No. 19. pp. 721–722, 725–727. With 3 figs. [Colonial Hosp., Benghazi.]

The author quotes records of previous observers and has been able to trace 22 cases of fever of the Tunis type during the past 16 years. Lice

have not been found; dogs are present in all the dwellings. During the period April-October when the disease is commonest ticks are seen on the dogs, and he suggests that the disease is transmitted by their agency.

H. H. S.

RAYBAUD (A.). La fièvre exanthématique en Italie. [**Eruptive Fever in Italy.**]—*Marseilles-Méd.* 1929. Dec. 25. Vol. 66. No. 36. pp. 792–795.

This is a summary of a paper published by CAVALLETTI, of the Polyclinic Umberto I of Rome, in the *Revista Ospedaliera* of July, 1929. It is recalled that CARDUCCI in Rome, in 1920, first described this malady which he had noted in the city since 1910. FALCONI in the same year described a similar disease.

CAVALLETTI notes that it has a marked seasonal character, cases being met with in Rome only from June to October. The clinical description accords with that of the observers in Marseilles and elsewhere in France. The disease is mild, although fatal cases have been met with, and PECORI records such a case in a young woman whose death was apparently due to the severity of the disease alone and not to any pre-existing disability, such as nephritis or tubercle.

In Italy the first attempts to obtain a positive Weil-Felix reaction failed, but the tests were carried out early in the disease. When the serum of convalescents was tested a fair percentage gave positive results, in one instance in a dilution of 1/3,200; but in most not higher than 1/200, or even 1/100. The Widal reaction was invariably negative. No parasite could be discovered in the blood either by microscopic examination or by culture. Examination of sections of skin revealed changes in and around the vessels resembling those of typhus. Examination for lice on the patients was negative. Occasionally ticks were found in their vicinity, particularly on dogs in the household.

CAVALLETTI is convinced that the disease studied in Italy is identical with the eruptive fever of Marseilles, although he is not certain that they can be identified with Brill's disease.

The reviewer, Raybaud, adds that the Marseilles fever, the eruptive fever of Italy, a similar fever described in Spain and macular fever of English observers are identical with the fever first described in 1910 by CONOR, BRUCH and HAYAT in Tunis under the name "fièvre boutonneuse," and that this name has priority and, therefore, should alone be employed.

D. H.

i. AUDIBERT (Victor) & MURAT. Fièvre exanthématique grave avec myoclonie et mort. [**Fatal Case of Eruptive Fever with Myoclonus.**]—*Marseilles-Méd.* 1929. Dec. 25. Vol. 66. No. 36. pp. 799–800.

ii. BOUSQUET (A.). Trois cas de fièvre exanthématique observés dans la banlieue marseillaise; rôle étiologique de la piqure des tiques. [**Three Cases seen in the Suburbs of Marseilles.**]—*Ibid.* pp. 806–807.

i. Fatal cases of eruptive fever are very rare. This case was that of a gardener, aged 62 years, living in the suburbs of Marseilles. The fever was not high, but the patient showed marked weakness throughout the

illness, which was terminated by death on the fifteenth day. The authors suggest that the virus of this fever may be compared in its action with the virus of influenza and is a neurotropic virus.

ii. Three cases of eruptive fever observed in the suburbs of Marseilles, with special reference to their causation by tick bite. One patient stated that fifteen days previously she had been bitten by a tick on the leg ; a " tache noire " developed at the site of the bite.

In the discussion which followed, several speakers quoted cases which supported the theory that the disease is conveyed by ticks.

D. H.

Conseil (E.). A propos d'une dénomination fièvre boutonneuse ou fièvre exanthématique. [**The Designation of Eruptive Fever.**]—*Presse Méd.* 1930. Apr. 26. Vol. 38. No. 34. p. 571.

Conseil points out that as it has been agreed that " fièvre exanthématique " of Marseilles is identical with the " fièvre boutonneuse " of Tunis the latter name should alone be used to designate the disease, since it was named thus in 1910 by Charles Nicolle and the term fièvre exanthématique was not used until 1927. Apart from this the former name may give rise to confusion, since the typhus virus is named by some " virus exanthématique."

D. H.

De (S. C.). **A Case of Spotted Fever (Rocky Mountain Fever, Tick Fever or Typhus Fever).**—*Indian Med. Gaz.* 1930. Apr. Vol. 65. No. 4. pp. 206–207. With 2 text figs. [1 ref.]

A case of fever in an Anglo-Indian, the guard of a train on the Bengal-Nagpur Railway. On examination : Temperature 103°, pulse 96, pain in the back and limbs, and considerable nervous prostration. On the fourth day a petechial rash of a coppery colour appeared on the forearms and legs, and within the next two days spread over the whole body with the exception of the face and forehead. A photograph shows its distribution two weeks after the temperature had become normal. In the author's opinion this case is similar to the cases of typhus-like fever described by Megaw. There was no history of tick bite and no mention is made of the Weil-Felix reaction.

D. H.

Pijper (Adrianus) & Dau (Helen). **The Aetiology of Tick-Bite Fever.**—*Jl. Trop. Med. & Hyg.* 1930. Apr. 1. Vol. 33. No. 7. pp. 93–94. With 3 figs. on 1 plate. [10 refs.]

Tick-bite fever is a well known clinical entity in South Africa and must not be confused with tick fever or relapsing fever. The disease is also known as Pretoria ten days fever, or Natal fever, according to the district. The bite of the tick gives rise to a typical primary sore followed by lymphangitis and fever. The disease resembles mild typhus and pseudo-typhus. It might also be compared clinically with Rocky Mountain fever, tropical typhus and tick typhus (Megaw).

The authors have examined about a dozen cases during the last few years by blood culture, blood smear, dark field examination, scrapings of sores, etc., but without result. The agglutination reactions with the various strains of Proteus were negative. Inoculation of guineapigs intraperitoneally with the blood of patients taken at the height of the fever, however, was followed by a slight rise in temperature and when the animals were killed some enlargement of the organs, spleen, suprarenals and lymph glands, was noted. In blood smears in some of the

mononuclear cells Rickettsia-like bodies were found in small numbers; as also in sections of the enlarged organs. Examination of the brains of these animals gave more definite findings; in sections suitably prepared and stained definite cellular nodules (lymphocytes and mononuclears) were found, and scattered about among these cells very numerous Rickettsia bodies.

Figures are given illustrating these findings and the authors consider that the tick-bite fever of South Africa should be included among the diseases associated with Rickettsia.

D. H.

ARCHIBALD (R. G.). **A Case of *B. lactis aerogenes* Bacillaemia.**—*Jl. Trop. Med. & Hyg.* 1930. Mar. 15. Vol. 33. No. 6. pp. 80–81. With 1 chart in text. [2 refs.]

The author refers to cases of pyrexia of uncertain origin in the Sudan and the neglect or impossibility of blood culture. In 1911 four such yielding blood culture of a bacillus resembling *Bact. Cloacae* were described.

An adult native was admitted to the hospital with fever, rigors and diarrhoea. The liver and spleen were enlarged, there was a rapid pulse and a polymorphonuclear leucocytosis was noted; cystitis also was present. Blood culture on the eighth day yielded a pure culture of a non-motile non-gram-staining bacillus. Four days later a second blood culture was taken and again the same organism was isolated in pure culture. An identical organism was also isolated from the urine, which was loaded with pus. The patient later became acutely ill with profound jaundice and symptoms of endocarditis, and died on the twenty-third day after admission. The biochemical reactions and other characteristics of this bacillus were typical of *Bact. lactis aerogenes*. No post-mortem was possible. The patients serum agglutinated the bacillus in 1/80. No agglutination of *Bact. typhosum*.

[This case can hardly be placed in the category of a pyrexia of uncertain origin. The case appeared to be one of septicaemia following cystitis.]

D. H.

SMYTH (F. G. A.) & CAMERON (W. M.). **Prolonged Intermittent Pyrexia associated with an Unusual Organism in the Blood-Stream.**—*Jl. Roy. Army Med. Corps.* 1930. July. Vol. 55. No. 1. pp. 42–46. With 1 chart in text. [1 ref.]

One is always chary of accepting "strange bugs" isolated in the process of blood culture; there are so many pitfalls in the technique. But the technique here seems to have been so well safeguarded, and so carefully checked that one is forced to agree that this organism was actually circulating in the blood stream of the patients.

Three cases of intermittent pyrexia occurred among the British troops in Cairo in 1929, and all ordinary causes of pyrexia were carefully excluded. All three cases showed clinical features in common, namely, preliminary catarrh and sore throat, followed by prolonged intermittent pyrexia, with an erythematous rash on the thorax and extensor surface of the arms and legs. There was a leucocytosis of from 18,000 to 35,000 white cells per cmm., with 80 to 85 per cent. polymorphonuclears. There was an entire absence of toxic symptoms, and in two of the cases

a non-Gram-staining coccus (which was neither a meningococcus nor *melitensis*, but resembled *catarrhalis* somewhat) was isolated from the blood in pure culture. In one case the same organism was isolated from the blood on two occasions at an interval of a week.

The organism is under investigation.

D. H.

Jamal-ud-Din. Short Term Fevers in the Punjab.—*Indian Med. Gaz.* 1930. July. Vol. 65. No. 7. pp. 365–367. With 9 charts in text.

Rubinato (Giovanni). Contributo alla febbre esantematica mediterranea.—*Policlinico.* Sez. Med. 1930. Oct. 1. Vol. 37. No. 10. pp. 500–508. With 1 text fig. [8 refs.] [Civil Hosp., Treviso.]

JAPANESE RIVER FEVER.

Tanaka (Keïsuke), Kaiwa (J.), Teramura (S.) & Kagaya (J.). Beiträge zur japanischen Kedani-Krankheit. [**Kedani Disease in Japan.**]—*Zent. f. Bakt.* I. Abt. Orig. 1930. May 15. Vol. 116. No. 6/8. pp. 353–385. With 69 figs. on 8 plates. [Refs. in footnotes.]

Four kinds of Trombidium, or Kedani larvae, are commonly found on the field mouse in Japan: the true Kedani mite, which bites man and is the carrier of the Kedani virus; the second and third types, often confused with the first, called Pseudo Kamushi A and B; and the fourth type to which the name *Trombicula autumnalis japonica* has been given. The major part of this article is taken up with a minute description of these four larvae, with a view to differential diagnosis.

A short chapter on the pathogenesis of the disease is included. The generally accepted view is that the field mouse is the carrier of the virus and the mite conveys it to man by its bite. It has been noted, however, that although many mites may bite a man, the eschar, or primary ulcer, will only appear at the site of one bite, the presumption being that only a few mites convey the virus. The man on whom this sore appears develops the disease. The virus is injected along with the salivary secretion.

Tanaka in 1907 showed that the blood of a man ill with Kedani fever is infective; but prolonged search of the blood failed to reveal any parasite. The authors took 50 cc. of blood from the arm vein of a patient and placed it in sterile vessels in Ringer solution. The following day the red cells had separated from the plasma. Ten to 20 cc. of this plasma were injected into a monkey, but without effect, whereas doses of 0·5 cc. and 1 cc. of the blood produced the disease when inoculated subcutaneously, with incubation periods of 15 days and 8 days. A quantity as small as 0·2 cc. of blood taken from a patient on the eighth day of the disease produced a modified attack in a monkey. If the blood is kept for a few days it loses its virulence. The virus is also readily destroyed by alcohol, ether, toluol, etc., and a temperature of 50° C. for ten minutes.

With passage through monkeys the attacks become less and less severe. Apparently the virus is present in greatest quantity in the liver and spleen of the field mouse. The attempts to pass the virus

through a filter failed. Apparently the virus is either in or attached to the red cells, as it could not be passed through a Pukall filter, which allowed *prodigiosus* to pass.

Monkeys sick with Kedani fever were injected intraperitoneally with 300 cc. saline solution. This was drawn off after an interval of 6 to 12 hours and was centrifuged. The sediment consisted practically entirely of white cells and a few—very few—red cells ; 0·3 cc. of this sediment injected into a monkey produced the disease after an incubation period of 14 days. This experiment would indicate that the virus may be carried on or with the white cells.

The Kedani virus has apparently a chemotaxic effect for, in the primary sore, invasion of polynuclear cells is noted. Mice, guineapigs and dogs are resistant to infection. Apparently the cercopithecus monkey is most susceptible, even more so than man.

Attempts are being made to immunize men against the disease. A case of carcinoma of the uterus was treated with injections of Kedani blood, which produced an attack of fever followed by marked improvement in the general condition, somewhat on the lines of the treatment of G.P.I. by artificially-produced attacks of malaria.

D. Harvey.

DEL FAVERO (Ernesto). La febbre fluviale giapponese è essa limitata ai paesi di Estremo Oriente ? [**Is Japanese River Fever limited to the Far East ?**]—*Arch. Ital. Sci. Med. Colon.* 1929. Dec. 1. Vol. 10. No. 12. pp. 590–592. English summary (4 lines) p. 593.

The author reports the case of an Arab returning to Aden from Singapore who exhibited the symptoms of tsutsugamushi disease with an eschar on the right arm and axillary adenitis. He refers to an unpublished case under Dr. WAVES of a young European treated in the Singapore General Hospital, his disease being " diagnosed by Japanese physicians of known experience " as Japanese River fever. Other cases have been reported in Sumatra (1902) and in the Federated Malay States (1915 and later).

H. H. S.

ISHIWARA (Kikutaro) & OGATA (Norio). **A Contribution to the Knowledge of the Nature of the Virus of Tsutsugamushi Disease.**—*Tokyo Ijishinshi (Tokyo Med. News).* 1928. July. No. 2581. [Summarized in *Japan Med. World.* 1928. Oct. 15. Vol. 8. No. 10. p. 276.]

The authors succeeded in passing and preserving the virus in the testicle of the rabbit. By this method of passage the virulence was increased. They also point out the fact that in the tissue of the inoculated testicle the presence of histoblasts and cell-inclusions could be demonstrated. The cell-inclusions appeared to be bacillary in form and when stained by Giemsa's stain showed evidence of bipolarity.

D. H.

MALARIA.

Records of the Malaria Survey of India. Calcutta. 1930. Oct. Vol. 1. No. 3. pp. 205–428. With numerous illustrations.

These records contain so much that is of wide interest that it seems a pity that they are not all accompanied by concise summaries for the benefit of malariologists in other parts of the world. Major A. E. Richmond and Asst. Surgeon J. C. Mendis report on malaria among troops in Peshawar during 1927. About Rs. 60,000 were spent on anti-malaria work during the three years 1925–1927, apart from the cost of the military personnel employed. The result was a failure; malaria remained as prevalent as before, though the usual drainage work, together with oiling and the use of Paris green, was carried out in all areas. The chief sources of anophelines are irrigation water and surplus tap water inadequately dealt with by drainage. The cantonment is very freely irrigated, and miniature swamps and pools are the result. The source of infection is the native bazaar population, among which gametocyte carriers are as common as they are rare among the troops. The barracks lie between the main mosquito-breeding areas and the native city of 90,000 inhabitants, which is practically continuous with the cantonment. Many soldiers are infected outside the barracks, while they are on leave in the town or on patrol duty, and this militates against the success of screening the barracks. The authors suggest that the proprietors of places of amusement should be compelled to keep their premises clear of mosquitoes, and that the bazaar population should be treated with quinine. Failing the screening of bungalows, they should be sprayed every three days with Flit, Mosquil (half the price of Flit), or kerosene. A vigorous prosecution of antilarval measures is necessary; infected insects are continually entering and leaving the barrack-rooms in which they remain for a very short time. Irrigation should be reduced to a minimum and, above all, proper drainage should be provided as soon as possible.

Mr. R. A. Senior-White reports on malaria at Delhi. Some 20 years ago it was decided to transfer the capital of the Indian Empire from Calcutta which was practically free from malaria, to Delhi, where malaria was so rife that in some wards the spleen rates reached 67 per cent., and in the neighbouring villages they were as high as 96 per cent. The site originally chosen, on which His Majesty laid the foundation stone, was liable to inundation and was the most malarious part of the whole area. This was abandoned as the result of a malaria survey, and another site was selected in the neighbourhood. A great deal of drainage and filling was done, and the author's survey, made in 1927, showed that an enormous improvement had occurred, with a reduction of about 30 per cent. in the spleen rates in most parts of the city. The carriers of malaria in Delhi are: *A. stephensi*, which hibernates in the wells, and *A. culicifacies*, which breeds in water continually kept fresh by rain, and which the author considers to be solely responsible for the epidemic malaria of the Punjab. The principal causes of the prevalence of the two anophelines are: (1) excessive irrigation combined with deficient drainage; (2) flooding of the Jumna, with water backing up the drains; (3) wells. Delhi is a mass of wells, and the author considers them entirely responsible for such malaria as exists in the new city; he found one with *A. stephensi* breeding in it, in the compound of a

European hospital where the nursing staff was suffering from malaria. He recommends : (*a*) the control of irrigation ; (*b*) a study of irrigation malaria by a joint committee of officers of the malaria, canal, and irrigation departments ; (*c*) a new system of drains to prevent the blocking-back by the Jumna ; (*d*) filling of borrow-pits ; (*e*) closing of wells ; (*f*) the appointment of a malaria officer.

Lieut.-Col. McCombie Young and Sub-Assistant Surgeon Syed Abdul Majid report on malaria in Sind, with reference to the probable effect of the new barrage across the Indus at Sukkar, which will probably be completed in 1931. This vast scheme aims at watering 5,900,000 acres of land, or 5,000 acres more cultivation than there is in the whole of Egypt, and it will lead to an enormous increase of land under wheat. The authors' conclusion with regard to the newly irrigated areas is that the resulting improved economic conditions of the people will raise their resistance to malaria. But, " as time goes on, and if water-logging of the soil occurs, less favourable conditions may be expected . . When the rise in the water level is such that kalar (salt deposits) appears on the surface, the fertility of the soil will be diminished, and adverse economic conditions will lead to an increase of malaria. . . . The question of water-logging is probably the biggest problem in the scheme." In the rice-growing areas, the endemicity of malaria is higher than elsewhere. The water in the rice fields of Sind evaporates quickly, becomes brackish, and deposits the salts known as kalar. The brackish water is run off by the farmer, and the surface of the soil is washed by repeatedly running fresh irrigation water on and off. This waste, brackish water (pancho water) is drained off on to the most convenient low-lying land, where it forms swamps in which enormous numbers of anophelines breed. These swamps are the source of the malaria, not the rice fields themselves. To drain off all this pancho water would be " a proposition too Utopian to be seriously considered. . . . In rural Sind there is little or no scope for antilarval measures." The average householder with an income of about £7 10s. per annum, cannot even afford mosquito nets for his family, and " even treatment by quinine, on an adequate scale, although very necessary, presents administrative difficulties. . . Apparently the only practical method of control is improving the economic conditions under which the people live."

Lieut.-Col. Gill contributes a paper on the relationship of malaria and canal irrigation in the Punjab. He concludes that irrigation has proved a great blessing (save in a few places) and that if water-logging is prevented, it will increase the health and wealth of the country.

W. Fletcher.

Eighteenth Annual Report, Medical Department, United Fruit Company, Boston, Mass. 1929. pp. 13–58, 65–103. **[Sixteen papers on Malaria.]**

The first part of that section of the report which is devoted to malaria deals with treatment, the latter part deals with the disease as it affects the Company's estates in Honduras, Panama, Costa Rica and Cuba.

Dr. N. P. Macphail reports on the routine treatment of malaria at the Company's hospital in Guatemala. Three tablets of plasmoquine compound (0·01 gram plasmoquine, with 0·125 gram of quinine sulphate) are given every day for the first six days of treatment, together with 15 grains of quinine sulphate twice a day. No toxic symptoms have resulted from the administration of these small doses of plasmoquine,

to approximately 20,000 people, with the exception of one patient who appeared to have an idiosyncrasy for the drug. Severe cases with vomiting are treated with intramuscular injections of quinine preceded by the subcutaneous inoculation of 8 to 12 minims of a 1 in 1,000 solution of adrenalin chloride. Intravenous quinine has been abandoned on account of the alarming symptoms frequently induced by it. Dr. Macphail has " not found that the usual objections advanced against intramuscular administration of quinine need be considered. When carefully given . . . necrosis is practically unknown." Dr. K. P. A. Taylor, however, who is attached to the same hospital in Guatemala, states, in his contribution to this report, that he has observed abscess formation, necrosis, severe secondary haemorrhage, fatal septicaemia, and sciatic nerve paralysis to follow intramuscular injections. For this reason he has turned to the rectal administration of quinine, and his paper describing the methods adopted and the results of the treatment is reviewed below, p. 109.

The routine treatment adopted by Dr. B. M. Phelps in the Puerto Castilla Hospital, Honduras, consists of 15 grains of quinine twice a day, without plasmoquine ; but, just before the patient is discharged he is given two tablets of plasmoquine compound, to destroy the gametocytes.

In the sixteenth annual report of the Medical Department of the United Fruit Company, Barber, Komp and Newman (see this *Bulletin*, 1929, Vol. 26, p. 939) reported that small doses of plasmoquine rendered a patient's blood non-infective for mosquitoes. Dr. Eugene P. Whitmore describes, in the current report, his own experiments in confirmation of this work, and gives protocols of eleven cases. He found that a single plasmoquine dose of 0·02 grams (or 0·326 to 0·341 mgm. per kilo of body weight) given to a patient suffering from subtertian malaria prevented infection of mosquitoes fed 20 hours to several days after that single dose. A single dose of 0·206 mgm. per kilo of body weight was not sufficient. Dr. Whitmore also contributes, in conjunction with Dr. J. H. Roe, a further paper on the study of the blood in blackwater fever (see this *Bulletin*, Vol. 27, p. 187). They found that " nitrogen retention is very commonly—if not generally —present ; indicating disturbance in the secretory activity of the kidneys and that this nitrogen retention may be so marked as to give the blood chemistry picture of an acute nephritis . . . there is no evidence of any marked deviation from the normal in any of the other chemical constituents of the blood : notably, sugar, calcium, cholesterol and lecithin." The direct van den Bergh was negative, while the indirect was strongly positive, reaching a high figure in one case.

Generally speaking, the methods adopted by the Company's officers in their anti-malaria campaign, are treatment of those infected with malaria, and the use of Paris green as a larvicide. It is difficult in some places, when road dust is not available, to find a suitable diluent for the Paris green. Lime mixed with saw-dust has been used by Dr. P. S. Malaret on the Preston Division in Cuba ; it has the advantage of leaving a white pellicle on the water, which enables the inspector to see at a glance which waters have been treated. Lime without saw-dust, and also wood-ashes, were found to be irritating to the hands of the labourers. Mr. J. Maltsberger describes the preventive measures adopted on the Chiriqui Land Company's banana division, which comprises a large area of about 100,000 acres, in the south of Panama, on the borders of Costa Rica. Dr. E. J. Salisbury contributes a paper on

the control of malaria in Costa Rica ; which he remarks, incidentally, is a white man's country, with 80 per cent. of pure European stock. The cost of general drainage, in Costa Rica, would be prohibitive and, therefore, Paris green is relied upon. One part is mixed with 100 parts of fine river silt, which is the most convenient diluent available.

In 1929, " medical treatment including hospitalization, anti-malaria prophylaxis and sanitation, cost $0·06 [3½d.] per employee per day ; and of this $0·05 went to hospitalization, and $0·01 to sanitation and anti-malaria work. During the two years of our intensive anti-malaria work, 719,000 five-grain tablets of quinine have been dispensed together with 325,000 doses of plasmochin compound tablets and 560,000 Pink Tonic Tablets as follow-up treatment, all at a cost of $4,800 per year."

W. F.

SOUTHERN MEDICAL JOURNAL. 1930. May. Vol. 23. No. 5. pp. 417–469. With 11 charts, 2 graphs & 1 map. [26 refs.]—**Symposium on Malaria.** [Twenty-two papers.]

The first of the papers in this symposium is the presidential address to the American Society of Tropical Medicine, on Recent Developments in the Control of Malaria, which was read by Dr. W. E. DEEKS in November, 1929. He pointed out that in the early days of the Panama Canal all medical treatment was given in the hospitals, which were over-crowded with malaria patients who had been lying ill for days in labour camps before admission. After their temperatures had been normal for five days they were discharged. Their blood was not examined on discharge, and they were probably reservoirs of prolific gametocyte infection, for, in 1926, Dr. H. C. CLARKE, working for the United Fruit Company, found that gametocytes were far more numerous in convalescents after treatment for acute attacks, than before treatment was begun. [See also R. GREEN, this *Bulletin*, 1929, Vol. 26, p. 931.] In order to prevent this, it is most important to begin treatment as soon as fever appears ; the sick must be sought out and treated in their homes. " It is the cases of frank relapse and acute primary infection that must be controlled if we are to prevent prolific gametocyte development ; and this can be effectually done by the prompt administration of quinine, in adequate dosage, at the onset of acute symptoms. . . . When the schizonts are destroyed and their proliferation prevented with quinine, no new gametocytes can be produced, as their source of production no longer exists." The malaria control program initiated on the United Fruit Company's estates in 1926 comprised : (1) Short radius mosquito breeding control ; (2) Repeated thick-film blood surveys ; (3) *Frequent visits to the labour homes, with the object of discovering the sick, and treating them immediately.* Patients were given " a sufficient supply of quinine and plasmoquine to provide a complete course of treatment, and were definitely instructed how the drug should be taken " ; (4) An educational campaign. As a result of these measures the number of admissions to hospital has fallen, the earning capacity of the labourers has increased, and the production costs are lower.

In a discussion following a paper read by Dr. T. H. D. GRIFFITTS on the use of Paris green in Georgia, Dr. Deeks made the following statements concerning malaria on the estates of the United Fruit Company. Although Paris green in a 1 per cent. dilution with dust has been used on these estates for several years, no instance of its toxicity to man or beast has been reported. (See also C. J. SCHUURMAN and

A. Huininк, Vol. 27, p. 582; also Lopez and G. di Mattei above, pp. 81–2). The methods of control are demonstrated to those in charge of labour; they inspect the quarters daily, and the sick found in camp are given 30 grains of quinine daily and two tablets of plasmoquine compound once or twice a week. The quinine is continued for 4 days, after which, if the fever has not subsided, the patient is sent to hospital; if it has, quinine is kept up for 2 days, along with two tablets of plasmoquine once or twice a week; afterwards, a modified Aitken's tonic tablet, containing 2 grains of quinine, is given three times a day. Trained sanitary inspectors visit the estates from time to time in order to supervise the work. When, in the neighbourhood of the labourers' quarters, there are large swamps which cannot be economically drained, "the only protection we can offer is to educate the people to protect themselves by screening and the use of nets. You cannot control the disease with quinine and plasmoquine." Plasmoquine has been found absolutely useless in the treatment of subtertian malaria, but it is used in small doses of 2 centigrams a week in order to sterilize carriers.

The symposium also contains an interesting paper by Dr. K. P. A. Taylor, on the administration of quinine by the rectum. The following technique was adopted: Two ounces of magnesium sulphate 1 hour before the evening meal. A soap enema at 7 a.m. At 8 a.m. 60 grains of powdered quinine sulphate in 2 ounces of olive oil, administered by means of a funnel connected with a soft rubber catheter, which has been introduced 2 to 4 inches into the rectum. The patient is told not to defaecate for 6 hours; rest in bed is generally necessary. The quinine mixture should be well stirred and shaken. The treatment is continued until the blood is free from parasites, i.e., 2 to 8 days. Satisfactory results in the reduction of temperature and the elimination of parasites were attained in eleven cases in which this method was tried. None of the patients was unable to carry out the treatment. [W. Fletcher (see this *Bulletin*, 1925, Vol. 22, p. 816) found that the absorption of rectal quinine in solution was slow and uncertain, and that its administration by this route was not to be relied upon in the treatment of malaria. There was little or no cinchonism in Dr. Taylor's cases, in spite of the large doses of 60 grains. He attributes this to slow, but regular absorption of quinine. This point needs further investigation.]

Dr. J. B. Ascanio-Rodriguez of Venezuela and Dr. H. Hanson of Florida drew attention to the importance of hookworm infection in conjunction with malaria. The latter stated that in Florida quacks visited the country giving "shots" of sodium cacodylate, which they claimed were malaria-preventive. "Unfortunately it appears that the practice of physicians sometimes leads to the belief that both cure and prevention of malaria rest with the hypodermic. Many persons showed arms scarred with abscesses resulting from quinine inoculations."

In a paper which he read before the National Malaria Committee at Miami in November, 1929, Dr. W. V. King discussed the question of anopheles and malaria in the Philippines. The disease on the island of Luzon is pre-eminently a disease of the foot-hills and is decidedly less important in the lowlands. There is very little malaria in the low-lying coastal district around Manila, which is full of swamps, nor is there much in the alluvial rice-growing plains although anopheles are very numerous, particularly in the salt marshes around Manila. In the high-lands and foothills, malaria is carried by *Anopheles minimus*, which breeds in clear, running, shady streams and is absent near the coast.

A. ludlowi, which is a formidable carrier in Java and Sumatra, is of no importance in the Philippines though it swarms in the salt marshes around Manila. Again, *A. maculatus*, which is the principal carrier in the Malay States, does not appear to be dangerous in the Philippines, though it is abundant in some places. It is noted that *A. minimus* is a wild mosquito, which does not remain in houses during the daytime. The malaria season occurs during the dry weather ; probably because the torrential rains of mid-summer flush the larvae out of the streams. (See also MANALANG, this *Bulletin*, Vol. 27, p. 640.) Dr. Victor HEISER, in the discussion which followed this paper, said that it was a good illustration of the necessity of defining a problem before undertaking control measures ; but for the preliminary survey, large sums might have been wasted on draining the lowland marshes. Dr. Heiser added that if malaria control is to be undertaken on a large scale in the Philippines, cheaper methods must be found than those which are used at the present time. W. F.

DE VOGEL (W.). Comparaison de la mortalité urbaine et rurale à Java. La malaria, cause de la haute mortalité dans les ports situés sur la côte septentrionale ; mesures prises pour la réduire. [**Urban and Rural Mortality in Java. Malaria the Cause of the High Mortality in the Northern Ports. The Means Taken for its Reduction.**] —*Bull. Office Internat. d' Hyg. Publique.* 1930. Sept. Vol. 22. No. 9. pp. 1717–1736. With 1 chart & 5 maps in text. [1 ref.]

During the period 1912 to 1913 the general annual mortality—urban and rural together—was 20 per mille ; but, in the three principal towns, Batavia, Samarang, and Soerabaja (ports on the north coast), the average mortality was 46·8. The cause of this high mortality was malaria, which acted by undermining the health and resistance of the population. Thirty years ago, Dr. de Vogel found that the death rate in Samarang was highest near the sea, and became gradually less farther from it. Where the death rate was highest, the spleen rate was 100 per cent. Everything pointed to salt water fishponds as the source of the malaria, and, although the water in them contained 28 parts of salt per 1,000, abundant anophelines were found breeding among the algae floating on the surface. In 1918–1919, van BREMEN showed that a similar state of affairs existed in Batavia. By means of mosquito cages suspended over the surface of the water, he made daily counts of the mosquitoes arising from a given area, and he estimated that the fishponds of the town let loose from 25 to 100 million mosquitoes on the population every day. The anophelines caught in the cages had a long range of flight, marked specimens were found 6,200 metres away from the point of release in windless weather. The fishponds produce two kinds of anopheles, *Anopheles rossii* and *A. ludlowi*. *A. rossii* is the more plentiful ; its maximum production occurs in water with a concentration of 6 to 7 per cent. of salt, and it may be present in concentrations even up to 8 or 9 per cent. *A. ludlowi* is not found in water with a salinity beyond 4 per cent. Experimentally, the *A. rossii* of Java are almost as easy to infect as the *A. ludlowi*, but, in nature, *rossii* is rarely found infected. WALCH showed by serological experiments that this was due to the different habits of the two mosquitoes ; he found that *A. rossii* fed on animals while *A. ludlowi* often fed on man. The problem presented by the fishponds appears to have been solved by WALCH and SCHUURMAN ; the water is run out of the ponds every few

weeks, and all is laid dry to the action of the sun, except for a ditch round the periphery of the pond, in which the fish remain until it is filled again after all the surface algae have been destroyed by the heat. (See this *Bulletin*, WALCH and SCHUURMAN, Vol. 27, p. 640.)

W. F.

FEDERATED MALAY STATES. **Annual Report of the Malaria Advisory Board for the Year 1929.** [WILSON (Christopher J.), Chairman.]—12 pp. 1930. Kuala Lumpur: F.M.S. Govt. Press.

This Report deals with a question of great importance. Species sanitation, or antilarval measures limited to the control of the dangerous carriers of a district, is, of course, far less complicated and expensive than operations directed against all the species of anophelines which may be present. *A. maculatus* (a fastidious stream-breeder) is the principal carrier of malaria in the Malay States; very large sums have been spent in eliminating its breeding places, and the results have been held up as an example of the success of the method. It appears from the report under review that *A. maculatus* is changing its habits, and that although, in the past, it was essentially a stream-breeder, its larvae have been found, on many recent occasions, in tins, household utensils, and the like. Mr. B. A. R. GATER, Entomologist, Institute for Medical Research, informed the Board that "*A. maculatus* was no longer a purely fresh water breeder, but had adapted itself to other conditions because of the gradual elimination of its natural breeding places by drainage and other antimalaria measures."

It has been suggested that trains may disseminate malaria. On several occasions, cases have occurred in parts of Kuala Lumpur where no breeding places could be found, and an inspection of the incoming mail-trains showed that considerable numbers of anophelines were brought into the town in this way.

The Entomologist reported to the Board that while he had caught a number of *A. maculatus* in a mosquito trap placed next to some coolie lines, he had caught none in the lines themselves. He concluded from this that the method of searching houses in mosquito surveys might lead to false conclusions as to the species carrying malaria. He found that adult *A. maculatus*, in captivity, lived for an average of 23 days without a blood meal. With a blood meal, they lived an average of 30 days, with a maximum of 40 days. Additional meals did not prolong life.

W. F.

IYENGAR (M. O. T.). **Jungle in Relation to Malaria in Bengal.**—*Indian Jl. Med. Res.* 1930. July. Vol. 18. No. 1. pp. 259–266. [1 ref.]

It is a common belief, shared by many medical men, that jungles are malariogenic. The author investigated this question in many parts of Bengal. The submontane zone, where jungles cover parts of the Terai on the west and the Duars on the east, is notorious for its malaria. *A. minimus*, *A. maculatus*, and other well-known carriers are found in the cleared areas, but, where the jungle remains, there are only harmless mosquitoes. In one notorious locality, with a spleen rate above 90 per cent., there was heavy breeding of *A. maculatus* and *A. minimus* in the cleared area at the edge of the jungle, while, a few yards within it,

the breeding of these species stopped altogether. The Sunderban area consists of a maze of islands cut up by a network of tidal channels. Some of the islands, on which rice is grown, are cleared and are bunded to keep out the tidal flood; others are covered by mangrove jungle. In the cleared area, the mosquitoes are so numerous that special precautions are taken to protect the cattle from them, and the inhabitants creep under mosquito-nets at dusk. Within the mangrove swamps, on the contrary, there are no anophelines and when the author had finished his day's survey work he took his boat there and halted for the night, thus entirely avoiding the mosquitoes. He found some pools in the jungle which were open to the sun, but yet were free from anophelines, and he believes that two factors are necessary for open-breeding: (1) exposure to sunshine, with consequent changes in the flora and fauna of the water; and (2) the availability of man and his domestic animals as food for the adult insects. He concludes that, "These observations point to a preservation of all existing jungle and to extension of jungle wherever feasible."

W. F.

Roy (D. N.) & Chowdhury (K. L.). **The Parasitology of Malaria in the Darjeeling Terai.**—*Indian Med. Gaz.* 1930. July. Vol. 65. No. 7. pp. 379–381. [School of Trop. Med., Calcutta.]

Malaria parasites were found in 53·5 per cent. of about 1,500 children examined in the Terai tea-gardens during 1929. The species indices were: Benign tertian, 40·3; Malignant tertian, 48·5; Quartan, 11·2. In the gardens on the Himalayan foot-hills parasites were found in only 10·8 per cent. Thin films were employed and none was examined for more than 6 minutes.

W. F.

Morin (Henry G. S.). Sur le paludisme des terres rouges de Cochinchine. Ses rapports avec les anophèles du pays. Premiers résultats obtenus par la lutte antianophélienne. [**Malaria in the Red Soil Districts of Cochin China.**]—*Bull. Soc. Méd.-Chirurg. Indochine.* 1930. Feb. Vol. 8. No. 2. pp. 187–191. With 2 figs. [Pasteur Inst., Saigon.]

The majority of the hot-beds of malaria in Cochin China lie in the "red earth" [laterite] districts. *Anopheles maculatus* and *A. minimus* are the principal vectors. Six per cent. of the latter, caught in malarious houses, have been found infected. Precise figures for *A. maculatus* have not yet been obtained locally. Anti-anopheline campaigns have been carried out with success on two plantations. On the worst of these, drainage and the fumigation of the coolie-lines with cresyl vapour cost the estate $2,219 in seven months. The daily sick rate of the coolies fell steadily from 20 per cent. to 3 per cent. (The seven months began in July and ended in January). The author calculated that 5,300 working days were saved, which, at 55 cents a working day, means a saving of $2,815, a net gain of $600. In addition to this, 60 hectares of land were reclaimed by the drainage, and a worn-out, depressed discontented labour force was made alert and happy. The individual coolies worked better, and most of them wished to sign on again at the termination of their contracts.

W. F.

Procter (R. A. W.). **Malaria in Native Reserves.**—*Kenya & East African Med. Jl.* 1930. Aug. Vol. 7. No. 5. pp. 141–146. [6 refs.]

The author suggests that malaria has been introduced into the highlands of Kenya within comparatively recent times, and he attributes the spread of the disease to the immigration of Europeans, which has increased the movement of natives who now go to and from work on estates, railways, and the like. Eight years ago, it was unnecessary to use mosquito nets in the higher parts of Nairobi, and there is every reason to suppose that malaria was no more common in the Reserves at a similar altitude. In those parts of the Kikuyu Province where transport facilities are good and there is much movement among the natives, malaria is making a steady advance into the higher and healthier areas. It is considered useless to attempt wide-spread antilarval methods, or even species sanitation, and the suggested remedies are, first, to make sure that every one suffering from malaria is adequately treated, and, secondly, to improve the economic condition of the natives by allowing them to grow crops of economic value. (See this *Bulletin*, 1929, Vol. 26, p. 907 (Campbell).)

W. F.

Longo (Domenico). La malaria in Tripolitania. (Nota clinico-epidemiologiche.) [**Malaria in Tripolitania.**]—*Arch. Ital. Sci. Med. Colon.* 1930. July 1. Vol. 11. No. 7. pp. 418–428. With 1 map in text. English summary (5 lines) p. 429. [Inst. of Trop. Path., Bologna.]

A map is given showing the principal towns and the degree of infestation with malaria. The chief malarial district is littoral but the zone extends from Zuara on the west to Jefren and Garian on the south and Tauorga on the east. The species of anopheles found are *A. algeriensis* and *A. mauritianus*. The cases, though few, are divided into indigenous and "metropolitan." Details of 30 of the former and 19 of the latter are shown in a table. *P. vivax* was present in 18 and 14 respectively, *P. falciparum* in 7 and 5, both parasites and *P. malariae* each once in the former.

H. H. S.

Frégonneau (Werner). Schiffsärztliche Malariaerfahrungen in Afrika. [**Malarial Experiences of a Ship's Doctor in Africa.**]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1930. June. Vol. 34. No. 6. pp. 330–336.

Cases came not only from the coast of Africa but also from the interior, and the infections, in order of frequency, were malignant tertian, benign tertian and quartan. The author used the thick film method with Giemsa stain for blood examination. For treatment he prefers plasmochin compound to quinine alone. In the treatment of blackwater fever he employs pure plasmochin with satisfactory results. In the prophylactic treatment of malaria he recommends quinine in doses of 0·2–0·3 gm. given every evening. In a footnote the editors

state that they have published this paper to show that it is quite possible for a ship's doctor to make precise observations.

E. D. W. Greig.

Earle (Walter C.). **Malaria in Porto Rico.**—*Amer. Jl. Trop. Med.* 1930. May. Vol. 10. No. 3. pp. 207–230. [8 refs.]

Malaria is a serious problem in Porto Rico, especially in the coastal region where nearly one-third of the population have parasites in their blood. Sugar cane is the principal crop in the unhealthy areas, and its method of cultivation favours the breeding of the carrier *A. albimanus*. Sub-soil drainage is the most hopeful solution of the problem; Paris green has been found useful in some regions. Treatment of the sick is considered a most important part of the work.

W. F.

Prado (Alcides) & Carvalho (Adolpho E.). A disseminação da malaria no Estado de S. Paulo. **Prevalence of Malaria in the State of São Paulo.**—*Archivos de Hyg.* Rio de Janeiro. 1930. May. Vol. 4. No. 2. pp. 21–30. With 1 folding map. English summary. Also in *Ann. Paulist. Med. e Cirurg.* 1930. May & June. Vol. 21. Nos. 5 & 6. pp. 94–97; 111–114. With 1 plate (map).

The author has produced a map showing the zonal distribution and the extent of prevalence of malaria in S. Paulo, divided into areas where malaria is almost unknown, and where it is of low and of "average" endemicity. There are no zones of high prevalence. Each year after heavy rains there is a temporary increase, but nothing which could be regarded as an epidemic. Benign tertian is by far the commonest form. [The letterpress is merely an amplification of the map.]

H. H. S.

Simmons (James Stevens), St. John (Joe H.) & Reynolds (Francois H. K.). **A Malaria Survey at Fort Stotsenburg, P.I.**—*Milit. Surgeon.* 1930. July. Vol. 67. No. 1. pp. 1–13. With 1 fig. & 1 map in text. [3 refs.] [Bureau of Science, Manila.]

Fort Stotsenburg lies at the foot of the Zambalaes Mountains, in a reservation traversed by streams, and malaria has always been a serious problem since the establishment of the port in 1902. There is a large native population living in the neighbourhood which furnishes a reservoir of infection. Previous surveys have shown that malaria in the Philippines is often a household disease which affects several members of a family. These families can be tracked down by finding children with enlarged spleens in the schools. Seventy per cent. of the malaria carriers in a community are found in families to which children with enlarged spleens belong. Instead of examining all the 3,540 natives at the Port, the authors examined the school children, and then took blood films from the families of those children with enlarged spleens. They examined the blood of 92 persons in all, and detected 62 carriers among them. As a control on these findings, 80 persons were examined who belonged to families in which all the school children had normal spleens, with the result that only two carriers were found. Used as an

adjunct to other antimalaria measures, and repeated at intervals of about six months, the detection and treatment of carriers should result in a material reduction of malaria.

W. F.

Riley (William A.). **Malaria and Anopheline Mosquitoes in Minnesota.** —*Minnesota Med.* 1930. June. Vol. 13. No. 6. pp. 410–411. [6 refs.]

The mean summer temperature of Minnesota is only about 60° F., and this precludes the possibility of more than rare cases of malaria, but such do occur. *A. punctipennis* and *A. quadrimaculatus* are present, and whenever anyone infected with malaria comes into the state, there is the possibility of the disease spreading. It is estimated that more than 1,600,000 tourists visited Minnesota in 1929, and in each of the 381 automobile tourist camps there was a daily average of 33·27 persons.

W. F.

Gratch (I.). La malaria nel Comune di Ravenna. Cenni storici ed epidemiologici. (**Malaria in Ravenna and Surrounding** [*sic*]. **Historical and Epidemiological Notes.**)—*Riv. di Malariologia.* 1930. Jan.–Feb. Vol. 9. No. 1. pp. 1–34. With 7 maps. [34 refs.] [English summary p. 94.]

The author sketches the prevalence of malaria in Ravenna from Roman times, but shows that it was not of serious importance till the latter part of the 18th century, when rice cultivation was taken up on a large scale. This led to widespread areas of infection, but at no time does it seem to have been very intense. The population of the Commune was 80,776 in 1928, and the total number of cases 612. Of these, 307 were benign tertian, 130 subtertian, 3 quartan ; in 172 the species was not determined. In Fosse Ghiaia in 1928, 1·8 per cent. of the inhabitants showed *P. falciparum* gametes and 18 per cent. suffered from malaria in some form. The following year the latter figure fell to 4 per cent. Many factors contribute to this amelioration, since all the usual measures have been employed—drainage, water-works, quinine prophylaxis, the use of larvicides, etc. Leron, a mixture of various mineral oils, was given a good trial and was found to be better than Paris green.

H. H. S.

Vinti (Giovanni). Epidemiologia della malaria in provincia di Bologna. (Casi autoctoni e casi importati.) [**Epidemiology of Malaria in the Province of Bologna.**]—*Arch. Ital. Sci. Med. Colon.* 1930. June 1. Vol. 11. No. 6. pp. 338–347. With 1 map in text. English summary (2 lines). [Inst. of Colonial Path., Univ., Bologna.]

A study of the returns for the last 20 years or so has shown that malaria in Bologna has markedly diminished. A map is given showing the small areas in which the disease is endemic and others into which it is imported ; the latter are much more numerous than the former.

Recent examinations have demonstrated the scarcity of infection in adults. In children up to 2 years of age, parasites were found in " 15

per cent. out of 38," *P. vivax* in every case. When bonification is complete and quinine more widely distributed, it is hoped that malaria will disappear entirely from the Province.

H. H. S.

FRANCHINI (Giuseppe). Malaria a risaia. [**Malaria in Rice Fields.**]—*Arch. Ital. Sci. Med. Colon.* 1930. June 1. Vol. 11. No. 6. pp. 321–323. English summary (7 lines) p. 324.

In the Province of Bologna rice is grown in rotation, that is for 2 or 3 years at a time, after which the land is used for dry cultivation—wheat, hemp, maize—for an equal period. In the rice areas malaria is common, outside them only a few cases are met with. Cattle, horses and pigs are kept in small numbers in the former, and if visited in the morning the ceilings of the stalls and sties are covered with Anopheles, which breed in the pools. The animals being few in number do not suffice for the mosquitoes which then attack man. The author agrees with ROUBAUD that the cattle constitute a strong protective barrier, and in the dry areas anopheles are fewer and the number of cattle sufficient for them.

H. H. S.

MALARIA-COMMISSIE UIT DEN GEZONDHEIDSRAAD. Jaarverslag over 1929 van de Malaria-Commissie uit den Gezondheidsraad [ALDERSHOFF (H.), Chairman]. [**Annual Report of the Malaria Commission of the Board of Health.**]—Reprinted from *Verslagen en Mededeelingen betreffende de Volksgezondheid.* 1930. July. 14 pp. [6 refs.]

This report is itself evidence of the importance of the malaria problem in Holland. It gives detail of the co-operation of localities and individuals in promoting antimalarial measures. Thus in Amsterdam in 1929 there were sent to be examined for malaria 532 preparations, of which 115 proved positive. In Alkmaar cheap quinine was distributed to an amount which worked out, on an average, to 0·6 gm. per head. A statement of malaria cases according to season, which had occurred in their practice, was furnished by some practitioners. The state of affairs as regards malaria is particularly up to date at Medemblik where systematic antilarval operations are being carried out with the support of the Rockefeller Foundation. Such antilarval operations were also carried out in Alkmaar and Amsterdam. For a water surface of 397,700 square metres 1,193 litres of paraffin were required. This was applied during the months May to September inclusive, and was distributed over 231,650 square metres of pond surface and 166,050 of ditch surface. In Amsterdam a systematic search of stables showed the presence of anopheles in 238 out of 1,775, while antimosquito measures resulted in the killing, on a rough estimate, of 2,674,000 anopheles. A search of houses in which malaria cases had occurred gave 1,273 anopheles in 38. Reference is made to the work of KORTEWEG, SCHÜFFNER and SWELLENGREBEL [see this *Bulletin*, Vol. 27, p. 648] on the latent period which occurs between infection and the actual outbreak of malaria in spring and early summer. Questions are raised in the report as to the value of drainage and reclamation in

swampy areas for real reduction of mosquitoes. The matter requires further investigation.

W. F. Harvey.

Nikolsky (A.). [**Spread of Malaria, and Counter-Measures in the Steppes of Middle Asia in Connexion with Increased Cotton Production.**]—*Pensée Méd. d' Usbéquistane et de Turquménistane.* 1930. Vol. 4. No. 9–10. pp. 74–80. [In Russian.]

It is proposed, in connexion with the so-called " five-year-plan " of the Soviet Government to increase the area of cultivation of cotton in Middle Asia to such an extent as to dispense entirely with foreign imports towards the end of that period. The author reviews the situation from the epidemiological point of view and concludes that an outbreak of malaria is imminent, since all the necessary conditions will be present. On the one hand, the localities concerned (Golodny and Dalversin Steppes) are endemic centres of malaria, both Anopheles and human carriers being present ; on the other hand, it is proposed to introduce into the country thousands of new workers from localities free of malaria, the provisions for housing being admittedly inadequate, and the breeding of mosquitoes being facilitated by increase of irrigation. All these factors taken together will, according to the author, inevitably lead to epidemics unless appropriate measures are taken beforehand. These are considered seriatim. Prophylactic measures such as mosquito-netting, better housing, quininization are out of question owing to lack of material and funds, and can only be applied to a small proportion of privileged workers (so-called " shock-groups "). The only remedies available are direct anti-mosquito measures and treatment of cases as they arise. As it is evident that no considerations of this kind will deter the Government from pursuing their program, a serious outbreak of practically uncontrolled malaria in Turkestan is to be expected.

C. A. Hoare.

Theobald (G. W.). **Malaria, Women and Quinine.**—*Proc. Roy. Soc. Med.* 1930. Aug. Vol. 23. No. 10. pp. 1491–1496 (Sect. Trop. Dis. & Parasit. pp. 31–36). [5 refs.]

The author concludes that " the withholding of some preparation of quinine from pregnant women suffering from malaria results in unnecessary loss of life, and is inexcusable, as the drug is more likely to prevent than to cause miscarriage and death of the foetus." Given in reasonable doses it is extremely unlikely to cause abortion, and there is very little evidence that it has any deleterious effect upon the child. Malarial toxins, on the other hand, may cause abortions, stillbirths, and deaths during the first week of life. Quinine taken prophylactically does not interfere with menstruation, conception, or pregnancy. Women should be medically examined before going to the tropics. Mosquito nets should drop sufficiently far from the edge of the mattress to make it impossible for any part of the body to touch the net. Women should wear a more mosquito-proof dress after sunset, unless they live in screened houses. Eastern tradition is bad for European men, and much worse for European women. Many women attempt to live lives in the East which they could not stand in the West.

W. F.

Le Roy des Barres (A.). Paludisme et chirurgie. [**Surgery and Malaria.**]—*Rev. Méd. et Hyg. Trop.* 1930. May–June. Vol. 22. No. 3. pp. 97–113. [80 refs.]

It is often said that whenever anyone who has lived in the tropics meets with an accident, or has to undergo a surgical operation, he is bound to have an attack of malaria. This is an exaggeration; and most of the observations on which this idea is based were made without the examination of blood films. Many rises of temperature after operations in the tropics are put down to malaria, though they have nothing to do with it. Trauma does sometimes precipitate a malarial relapse, but in this respect it does not differ from cold, fatigue, or other causes which lower the resistance of the patient. Malaria influences the course of injuries and the healing of wounds, because it causes anaemia and visceral changes which lower the resistance; it acts in this respect like many other infections. As for the intermittent haemorrages which are said to occur in the wounds of malarial subjects, the author does not believe in them. Before operating on a malarial patient, the malarial infection and the anaemia should be treated. Chloroform should rarely be employed as an anaesthetic, because the liver is so often affected in malaria. Above all, the blood should be examined, preferably in thick films, if there is any rise of temperature after traumatism.

W. F.

Kyriasidis (K. N.). Ueber den Einfluss der Malaria auf den Widerstand des Organismus bei Tuberkulose. [**Effect of Malaria on Resistance to Tuberculosis.**]—*Deut. Med. Woch.* 1930. June 13. Vol. 56. No. 24. pp. 995–997. [29 refs.] [Evangelismos Hosp., Athens.]

The author determined the opsonic index to tubercle bacillus in 128 malarial patients, 69 acute and 59 chronic, all, except 8, being infections with *P. falciparum*. He tested the von Pirquet reaction in 125 adult cases of malaria. He concludes from his immunological observations that: (1) the reaction of von Pirquet and the opsonic index indicate that malaria does not produce favourable conditions for tuberculosis; (2) the increase of opsonin in the serum shows that, in chronic malaria, the body offers powerful resistance to the development of tuberculosis.

E. D. W. Greig.

Merzbacher (L.). Die Beziehungen der natürlichen Malaria zur Syphilis. Ergebnisse einer Studienreise nach den Nordprovinzen Argentiniens. [**Relation of Natural Malaria to Syphilis. Results of Study Tour in Northern Provinces of Argentina.**]—*Deut. Ztschr. f. Nervenheilk.* 1930. Apr. Vol. 113. No. 1/3. pp. 1–49. With 1 text fig. [3 refs.]

In the year 1915 in the provinces of Salta and Jujuy 61,734 persons were treated at the antimalarial centres. The population is 240,000. Fifty-five per cent. were attacked by benign tertian, 12 per cent. by quartan, and 4 per cent. by malignant tertian; the remainder were mixed infections. In the months of March and April 1920 in Jujuy, 65 per cent. of the children showed

definite signs of malaria, and in Salta during the same period, 81 per cent. The investigation was carried out by questionary to 400 medical men, and by a study of cases at San Roque Hospital, Jujuy. One hundred and twenty cases were studied clinically and serological examinations of the blood and cerebrospinal fluid were made. The author concludes that the severest forms of post syphilitic diseases are very rare in malarial areas, which he regards as a striking indication of the curative effect of natural malaria. The paper contains a series of tables giving full records of the observations.

E. D. W. Greig.

VARGAS (Abel). E' a malaria possivel em qualquer região de anópheles? (Nota prévia.) [**Is Malaria Present wherever there are Anopheles?**] —*Folha Med.* 1930. Aug. 15. Vol. 11. No. 23. pp. 272–275.

The author answers this question in the negative and gives instances of localities where there are malarial patients and anopheles but no proved transmission from the sick to the healthy; also in the suburbs of Rio de Janeiro malarial incidence has fallen without any reduction in anopheles. He mentions the various hypotheses to explain this, such as immunity on the part of the mosquito (maintained by ALESSANDRINI and controverted by S. P. JAMES), the nature of the food of the mosquito, e.g., cotton, alfalfa, preventing development of the gametocytes, and the food preference of mosquitoes for the larger domesticated animals rather than man.

He concludes, however, that the cause is that malaria is contracted in the houses, and that in the districts where anopheles is present but malaria is not the mosquitoes come into the house merely for a feed and then disappear to lay their eggs, for examination of those caught in the dwellings in Parahyba, for example, proved them to be uninfected.

H. H. S.

CIUCA (M.), BALLIF (L.) & VIERU (M.). Immunité dans le paludisme expérimental. [**Immunity in Experimental Malaria.**]—*Arch. Roumaines Path. Expérim. et Microbiol.* Paris. 1930. June. Vol. 3. No. 2. pp. 209–229. With 1 text fig. [23 refs.]

A high infant mortality is characteristic of intensely malarious countries; but, after the third year of life or of residence in such a country, an immunity is acquired; this, however, is not proof against a new strain introduced by immigrants. The authors have made observations on a group of 518 patients who were receiving therapeutic inoculations for general paralysis and other diseases, and they have reached the following conclusions :—

1. In Rumania, the percentage of positive results following a single inoculation of virulent benign tertain blood is 53·3; in quartan it is 61·3; in subtertian it is 80.

2. A percentage of 18·6 of the benign tertian cases, 15 per cent. of the quartan, and 18 per cent. of the subtertian, have parasites in their blood without fever or symptoms. Most of these (the quartan not so readily) get rid of their parasites without treatment.

3. After repeated inoculations of benign tertian blood, an immunity is obtained in 100 per cent. which will resist the inoculation of 65 to 220 cc. of virulent blood infected with the same strain of parasite; but only 67 per cent. will resist inoculation with another strain of benign tertian.

4. Immunity follows the repeated inoculation of a quartan strain in 72 per cent.

5. There is no cross immunity between the three types of parasite.

W. F.

i. Tegoni (G.). with the collaboration of Aureli (B. Williams). Indice bibliografico della malaria. III. 1928. **Index to Malaria Literature.**—Supplement to *Riv. di Malariologia.* 1930. Vol. 9. 114 pp. [Experim. Station, Anti-Malaria Campaign, Rome.]

ii. Moufel (P. P.). Indicateur bibliographique des travaux russes sur le paludisme. [**Bibliography of Russian Malaria Literature.**]—*Russian Jl. Trop. Med.* 1929. Vol. 7. No. 9. pp. 582–597. [In Russian.]

i. Since 1928 the Stazione Sperimentale per la Lotta Antimalarica at Rome has published as supplements to the *Rivista di Malariologia* yearly bibliographical indexes to malaria literature. The first and second of these supplements covered the malaria literature for the years 1926 and 1927, that under notice records the more important papers which appeared in 1928. Over 1,500 references are given, classified under ten main headings: General articles, Congresses and Reports—History, geography, etc.—Economical and technical programmes and projects—Parasitology—Pathology and clinics—Anopheline mosquitoes—Epidemiology—Control—Malarial therapy—and Haemosporidia in animals. The numerical classification used for malaria references in the library of the Stazione Sperimentale is given in an Appendix.

ii. Dr. Moufel's bibliography of Russian papers on malaria supplements four earlier lists which appeared in the *Russian Journal of Tropical Medicine* in 1924 (No. 2, pp. 74–77), 1926 (No. 1, pp. 28–64), 1927 (No. 7, pp. 450–467) and 1928 (No. 1, pp. 63–65). This latest list gives 689 additional titles collected from some 94 Russian medical journals (of which less than 10 per cent. are readily to be seen in London). With the earlier lists it brings the total of recorded Russian papers on malaria to over 2,600, of which 1,400 by some 1,000 Russian authors have appeared since 1922. Relatively few of these titles have found their way into other bibliographies of malaria.

R. L. S.

Deeks (W. E.). **Progress in Malaria Control.**—*Jl. Trop. Med. & Hyg.* 1930. Apr. 15. Vol. 33. No. 8. pp. 101–103. [3 refs.]

In order to control malaria, we are compelled to wage war on mosquitoes; but our efforts must be restricted to short-radius sanitation around habitations, because it is impracticable to deal with very large areas. Where anti-larval measures would entail unjustifiable expense, screening must be employed instead. The treatment of the human carrier is of the greatest importance. The only known specific remedies which will destroy the schizonts are the salts of quinine [?the cinchona alkaloids]. The gametocytes can be destroyed by plasmoquine; Eugene Whitmore has found that if a single dose of 2 centigrams si given to a gametocyte carrier it will render him non-infective to mosquitoes for a period of seven days (see Report of United Fruit Co. above p. 106). Labourers should be congregated in camps or villages on carefully-chosen sites, in order that the areas requiring sanitation may be restricted to narrow limits in which schools, dispensaries, and medical attendance will be available. One of the essential requirements in the control of malaria is an adequate and well balanced food supply.

The administration of quinine can be safely left in the hands of the intelligent laymen, who can also give plasmoquine, the small non-toxic doses of which will prevent the infection of mosquitoes; thus "the control of malaria has become a home and lay problem instead of a hospital and skilled medical problem. Intelligent medical supervision supplemented by a technician to check up progress reports, and a co-operating organized lay personnel educated in some elementary essentials should be able to control malaria in any tropical district to the extent of its ceasing to be a serious economic problem." This plan is proving successful in the plantations of the United Fruit Co., and, during the last four years, there has been a steady fall in the number of cases requiring hospital treatment; in 1925 the rate was 239 per thousand; in 1929 it was 89.

W. F.

Scott (G. Waugh). **Report on Malaria Prevention Work carried out at Chenderoh.**—*Malayan Med. Jl.* 1930. Sept. Vol. 5. No. 3. pp. 86–89. With 8 figs. on 4 plates.

This paper describes the success of antilarval measures in a large engineering undertaking. A big dam was being constructed across the upper reaches of the Perak River, by the Hydro Electric Power Company. A clearing was made in virgin jungle, and the labour force began to assemble before the felled timber was removed or drains could be made. *A. maculatus*, the notorious carrier, began to breed in the swamps and streams exposed by the felling of the jungle; all the conditions favoured an epidemic of malaria, but this was prevented by the measures adopted, and a labour force of more than 4,000 people, including over 100 Europeans, was kept healthy and contented. The death rate for the 3 years occupied in constructing the dam was only about 4·5 per mille, and there were only 8 cases of malaria among the Europeans during the whole period. Labourers, living a little over a mile away, under similar conditions apart from antilarval measures, suffered severely from malaria. The measures adopted were: (1) Regular weekly oil-spraying of all water surfaces within half a mile of the camp, or up to the edge of the virgin jungle in which *A. maculatus* does not breed. (2) Reduction of water surfaces by drainage. Open drains were made and kept oiled; subsoil drains were employed in the portion of the clearing which is to be occupied permanently. Irregular streams were canalized and trained. (3) All fever cases were sought out and taken to hospital; no case was allowed to remain for more than one day in the coolie lines.

W. F.

Thompson (T. O.) & Grant (P. F. A.). **The Cantonment Antimalaria Problem. Afterthoughts.**—*Jl. Roy. Army Med. Corps.* 1930. May & June. Vol. 54. Nos. 5 & 6. pp. 368–376; 434–439. With 2 text figs.

The authors are of opinion that mosquito destruction is not a suitable method for the eradication of malaria in Indian cantonments, and that "therefore we must fall back on protection, the individual protection of the mosquito-net and the mass protection of the proofed barrack." The dictum of Christophers, Sinton and Scovell, that a malaria survey should always be made before undertaking any action

in regard to the prevention or amelioration of malaria, they regard as a counsel of perfection. The military anti-malaria officer has not the time necessary for this; in support of this statement they recall the case of an anti-malaria officer who was also officer in charge of a dermatological section, officer detailed for training stretcher-bearers and sanitary squads, officer in charge of medical wards, medical officer in charge two units and the R.A. brigade, and temporary staff surgeon as well. They urge the importance of trustworthy statistics in connexion with malaria, so that its cost to the army may be shown in figures which the lay administrator can understand. "We want," they say, "to be able to go to the purse-holders and say, 'Look here, in such and such a cantonment the cost, the actual cost of malaria during the last three years has been so much.' . . . It would be a great help if some general figure of the total cost of each malaria case could be obtained." There are many army returns which give the reputed number of malaria cases, but the authors doubt if these represent the true facts of the case; there has been much hiding of cases by detaining mild cases or treating them in barracks, possibly with the object of avoiding censure from higher authorities. They strongly recommend the treatment of all malarious children of troops and followers, in order to protect the soldiers. They have found it useful to spray the barracks with a solution composed of 98 per cent. kerosene and 2 per cent. carbon tetrachloride; fumigation proved useless. They also recommend the keeping of spot-maps showing the breeding-places of mosquitoes, and the position of the bed occupied by every case of sickness. They deplore the ignorance which prevails even among those who are supposed to know; for example, an R.E. officer responsible for the expenditure of several thousands of rupees of anti-malaria funds was asked in an examination paper to describe what anti-malaria measures should be carried out under certain conditions. His reply was, "Burn all litter to prevent breeding of mosquitoes."

W. F.

McLean (N.). **A Tour of Anti-Malarial Activities in Europe.**—*Kenya & East African Med. Jl.* 1930. May. Vol. 7. No. 2. pp. 46–53.

The author was a member of a party of 10 medical officers and entomologists who attended a special malaria course organized by the League of Nations in 1929. Lectures and demonstrations were attended at the London School of Hygiene and Tropical Medicine during June, in Italy during July, and at the Institute of Tropical Medicine at Skoplje, Yugoslavia, during August. In connexion with the London course, mosquito control schemes were studied at the British Mosquito Control Institute in Hayling Island. A large part of the time spent in Italy was occupied in visiting various parts of the country where operations were in progress. Bonification works are classed as: (1) Hydraulic or grand bonification, by which is meant the conversion of swamp land into land suitable for agricultural purposes by means of drainage and irrigation canals together with their pumping stations. And (2) integral bonification, which follows hydraulic bonification and consists of all measures directed at improving the economic conditions of the agricultural population which settles on this land, by: (*a*) good housing; (*b*) stabling of domestic animals; (*c*) control of mosquitoes; (*d*) building of good roads. (See also Lutrario

below, p. 125). As a result of these measures malaria is diminishing rapidly, while the ancient agricultural activity is being reconstituted under modern methods.

Drainage is not sufficient by itself, the soil becomes too arid, and it is necessary to have recourse to irrigation and anti-anopheline measures. The large drainage canals of Ostia constituted, for 40 years, extensive breeding places for anophelines, and malaria continued until anti-mosquito measures were adopted. The statistics of control stations show that, in the Campagna, no other means of malaria control can compare with Paris green as regards effectiveness and inexpensiveness. At Massarosa, the party saw an anopheline area where there was no malaria. There were many anophelines in the cow-sheds and pig-sties, but very few in the farm houses. The spontaneous abolition of malaria in this area is attributed to a change in the habits of the anopheles for whose nutrition animals are taking the place of man. "For this phenomenon to occur it is necessary that dwelling-houses should be well lighted, airy, and with white-washed walls." (But see J. G. Thomson below.) In the Pontine Marshes, large drainage canals were being made with modern mechanical excavators. In some of the neighbouring country which had been brought under cultivation, screening was the only method of protection employed ; in other places, Paris green was being used. The party also visited the great bonification works at Ferrara, in Northern Italy, which were started several years ago, and have been responsible for the reclamation and irrigation of thousands of acres of marsh land. This reclamation, combined with good housing and a system of mosquito control, has produced a healthy and prosperous agricultural population. At Monfalcone there was a vast swamp too difficult to drain ; this was sprayed with Paris green by aeroplane, with the result that the town became healthy. "The successful and extensive use of Paris green . . . was one of the most striking features of an interesting and instructive tour." In Yugoslavia, the party visited farms, drainage works, and schools in the neighbourhood of Skoplje, where malaria is being reduced by drainage and the extensive use of Paris green ; outside the towns there is much malaria. In the mountainous districts, where *A. superpictus* is the chief vector, Paris green is being used with some success.

W. F.

Thomson (J. G.). **Observations on the Antimalaria Campaign in Italy.** —*Proc. Roy. Soc. Med.* 1930. May. Vol. 23. No. 7. pp. 1011–1016 (Sect. Trop. Dis. & Parasit. pp. 15–20). [7 refs.]

Dr. Thomson visited Italy, in 1929, at the joint invitation of Professor Missiroli, the Director of the Anti-malaria Station in Rome, and Dr. Hackett of the Rockefeller International Board of Health. He was chiefly impressed by the thoroughness and success of the measures adopted for mosquito control, and particularly by the efficacy of Paris green.

"The anti-malaria campaign in Italy is an attempt to eradicate malaria by anti-larval measures. . . . Quinine was for many years almost the only method used to diminish malaria in many parts of Italy, but, here again, the difficulty of efficiently controlling the use of this beneficent drug led to disappointment. The Italian Government, through its Health

Department, having taken into consideration all the varied factors likely to be encountered, have adopted anti-larval measures as the most important means of diminishing malaria."

Breeding places which cannot be filled or drained are treated with larvicides. At Sermoneta, on the edge of the Pontine marshes, at Portotorres in northern Sardinia, and at Siniscola, the use of Paris green has resulted in a great decrease of malaria. The Paris green (a double salt of arsenite and acetate of copper, containing 58·62 per cent. arsenious anhydride) is obtained from Siegle & Co., of Stuttgart, and from William Sattler of Schweinfurt, at a price of 10 lire (26 pence) per kilo. It floats on water for about twenty-four hours and then sinks; rain makes it sink more quickly. One litre of a 1 per cent. mixture with fine road-dust is sufficient for 100 square metres of water. The mixture can be safely applied to water because the arsenic is volatilized by various moulds and disappears in 48 hours. It is harmless to fish, and it does not destroy culicine larvae. The frequency with which Paris green should be spread depends on the rate of development of the larvae. In Italy, the water is treated every 20 days up to the end of April, every 15 days up to the end of May and every 10 days from June onwards. Malaria has disappeared spontaneously from certain parts of Italy, such as the Val di Chiana and Massarosa, where *A. maculipennis* feeds almost exclusively on cattle, and does not go into the houses, though they are the same dark, ill-ventilated places that were in use when malaria was prevalent. (But see N. McLean above, p. 122).

In the discussion which followed this paper Colonel S. P. James said that he thought Dr. Thomson had somewhat unduly emphasized one aspect of the work in Italy. Quinine treatment and prophylaxis had brought about a rapid and continuous decline of malaria mortality, from 500 per million in 1900 (the year when the State quinine law was promulgated) to only 61 per million in 1923. More than £8,000,000 was being spent on the bonification schemes of the Pontine marshes and the Tiber delta. Dr. E. Stolkind who had studied the anti-malaria campaign in Italy also testified to the successful results of wholesale quinine distribution in the country. (See also A. Celli below, p. 126).

W. F.

Hackett (L. W.). **Malaria Control through Anti-Mosquito Measures in Italy.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1929. Apr. 25. Vol. 22. No. 6. pp. 477–499. With 4 graphs, 1 map & 1 plate. [7 refs.]

The Malaria Experiment Station in Italy is a collaborative undertaking between the Rockefeller Foundation and the Italian Government; Professor Missiroli is the director. It was founded in 1924 for the purpose of finding out if malaria could be controlled by simple inexpensive anti-mosquito measures, and a rigorously imposed condition was that the expenses should not exceed the sums actually being spent by the community on malaria treatment. Field stations were established in Sardinia and Calabria in 1925; the work has now been extended to 15 localities, and this report is chiefly concerned with Portotorres in Sardinia, a town of 6,000 inhabitants, notorious for its malaria. When work was begun, about half the people had chronic malaria, but the application of antilarval measures, over a period of four years, reduced

the parasite index from 34 to 3, the spleen index from 47 to 13, and the reported cases from 1,300 to 200. The infant infection rate, not known at the outset, was 4 per cent. in 1925 and only 0·8 per cent. in 1928. The causes of malarial prevalence were a sluggish river, three or four marshes, and many miscellaneous collections of standing water. The principal carrier was *A. maculipennis*.

The method adopted was dusting with Paris green and the results were almost miraculous. Each succeeding year, there were caught at the catching stations established at the periphery of the town only about half the number of anophelines caught during the previous year. The Paris-greening was begun in the spring as soon as fourth-stage larvae were found, and it covered a radius of three kilometres from the edge of the town. The annual cost of antilarval measures, for the four years, averaged 22,500 liras (£245) : the annual cost of medical treatment, before the work was undertaken, was £270 to £330 a year, including 12 kilograms of quinine. The trend is toward complete disappearance of malaria in Portotorres ; this is reflected in the social and economic changes which are taking place in the town. Previous to 1925, no one from out of the town would willingly spend the night in it, but now families are moving in and hotels are being built. During the first year, quinine was given to malarious children, but this treatment of the sick did not prevent transmission or reduce the total malaria. At Bianconovo, one of the most malarious places in the region, malaria practically disappeared at the end of three years through antilarval measures alone. At Torpe, in northern Sardinia, quininization was tried without anti-mosquito measures. There was little or no success ; it did not prevent a rise in the parasite and spleen rates in the epidemic year of 1928 ; though, during the same period, Portotorres became the least malarious community in Sardinia.

In scattered rural populations, the burden of prevention must be shifted from the community to the individual, who can protect himself by screening and antilarval measures. This has been proved in a portion of the Roman Campagna called the Valchetta, in which the houses are screened and each owner applies Paris green to breeding places ; malaria has been almost eradicated by this method in three years. Dr. Hackett contends that where there is much malaria there are also many man-biting anophelines. If there are many anophelines without malaria, the anopheles are not man-biting carriers. If there is much malaria without anopheles, it is probably accounted for by the peak of mosquito density preceding the malaria peak by four to six weeks. In Italy there is a remarkable drop in anopheline density late in July and August. In August the annual epidemic of malaria is in full swing, when practically no mosquitoes can be found.

(See also Missiroli, this *Bulletin*, Vol. 27, p. 219.)

W. F.

Lutrario. Quelques idées sur les " bonifications " en Italie. [**Bonification in Italy.**]—*Bull. Office Internat. d'Hyg. Publique.* 1930. Apr. Vol. 22. No. 4. pp. 714–721. [11 refs.]

What does the word "bonification" mean in Italy? It comprises three classes of fundamental measures in the campaign against malaria. These are : (1) Large bonification ; (2) Small bonification ; (3) Human bonification.

(1) Large, integral bonification. According to official documents, the first law on the subject of bonification, that of Bacarrini in 1882, was concerned only with the drainage of swamps, without taking into account the provision and utilization of water. This was successful in some parts of Italy, but in others, which were subject to long periods of drought, the marshes provided the only pasturage during the summer, and could not be drained without damage to agriculture. In 1923, the National Government recognized this, and decreed that all hydraulic work should be conducted with the object of creating a healthy neighbourhood suitable for a resident population, which should not only be protected from water by drainage, but also assisted to make use of it in irrigation. In addition to irrigation, the new laws provide for roads, canals, and water supplies, electric power and the building of farmhouses and villages. The object of integral bonification is to make the country fit to support a healthy and contented resident agricultural population, and it embraces all the measures which assist in the accomplishment of this aim ; such may be the straightening of a river, or the converting of a salt marsh into a fish pond. The *Chef du Gouvernement* has said " It is necessary to ruralize Italy, even if it costs thousands of millions, and tens of years work " and the government has provided for the integral bonification of 2,385,000 hectares of land at a cost of 7,500 million lira (£80,000,000).

(2) Small bonification : this is a part of large integral bonification. It consists of the abolition of stagnant water, cleaning up drains and putting them in order, and a campaign against mosquito breeding. Small bonification is limited to the neighbourhood of dwellings.

(3) Human bonification. By this is meant the intensive treatment of all infected persons in a given area, during the winter, with the object not only of preventing relapses but also of preventing the infection of anopheles at the beginning of the hot weather. Experiments made on farms and in isolated hamlets, free from invasion by infected mosquitoes, have given excellent results.

W. F.

Celli (Anna). **The Cinema in the Campaign against Malaria.**—*Internat. Rev. Educational Cinematography.* Rome. 1930. May. Vol. 2. No. 5. pp. 618–623. With 1 text fig.

Ichok (G.). L'action sanitaire à l'étranger. Le cinématographe contre le paludisme en Italie.—*Rev. d' Hyg. et de Méd. Préventive.* 1930. Nov. Vol. 52. No. 11. pp. 847–856. [1 ref.]

" The cinematograph has become the most efficacious and rapid of all the means of anti-malaria campaign in the Province of Rome." During the past three years, before the shepherds and peasants went down to the marsh-lands they were shown on the film the danger of fever, the means of avoiding it, and the way to treat it. The usual anti-malaria lectures were not understood by such people, nor did British and American cinema-shows meet with success, because the environment was foreign ; the peasants are able to identify themselves only with educational films of local production. Malaria, like all biological phenomena, is subject to vast fluctuations of a more or less regular kind. It is generally supposed that the fall of the Western Empire was responsible for the abandonment of the Roman Campagna, but during the Renaissance the Campagna was again alive with villas and palaces

as in the days of Imperial splendour, and Ostia was a health resort. In later centuries malaria grew more and more destructive; Ostia was abandoned, Magliana shared the same fate, and Rome was only a healthy oasis in the midst of a pestiferous desert. During the past 25 years, enormous progress has been made in reclaiming the land from the evil, and Rome is now surrounded by gardens and villages. "Quinine was the primary cause of the success of hydraulic and agrarian effort, this is used on a big scale as a preventive measure against the disease, and, thanks to it, a new, healthy, and industrious, population is growing up to repopulate the country." (See J. G. THOMSON above, p. 123.)

W. F.

VAUCEL. La lutte contre le paludisme en Yougo-Slavie et en Italie. [**The Campaign against Malaria in Yugo-Slavia and Italy.**]—*Ann. de Méd. et de Pharm. Colon.* 1930. Jan.–Feb.–Mar. Vol. 28. No. 1. pp. 5–34.

Dr. Vaucel also accompanied the party to Yugoslavia and Italy. In Yugoslavia the anti-malaria campaign constitutes only one part of a vast programme of hygiene in course of execution. Funds are not available for large works and only quininization and the less costly anti-larval measures are carried out, under the supervision of the Institutes of Hygiene established at Belgrade, Skoplje and Trogir. In the plain of the Danube the floods of spring and autumn provide innumerable breeding places for *A. maculipennis*, and it is intended to reclaim the whole area subject to floods when funds are available. In Macedonia malaria is prevalent throughout the year; only January and February are relatively healthy. The splenic index is about 35 per cent., in some places as high as 100 per cent. The vectors are *A. maculipennis* and *A. superpictus*. The first is responsible for the benign tertian and about two-thirds of the subtertian malaria, the second is the vector of *P. falciparum* in the autumn. Almost all the breeding places around Skoplje are pools in the dried bed of the river Vardar, and in irrigation channels running through gardens. All breeding places are treated with Paris green every 8 days, and examined for larvae on the following day. Mass quinine prophylaxis is not in force, but all carriers of parasites are given 1 gram of quinine daily for seven days, and, after freedom from parasites has been determined, for 3 days more. The results of the campaign have been good, fourth stage larvae and nymphs are rarely found in the breeding places, and there are few mosquitoes in the cowsheds. The plasmodial index, which was 35 per cent. in 1923, was only 12 per cent. in 1929. A trial of the same methods on a large scale is being undertaken, with the assistance of the Rockefeller Foundation, in the region of Kriva Palanka, near the Bulgarian frontier. In Dalmatia, which is one of the most malarious countries in Europe, *A. maculipennis* is the vector in the north, and *A. elutus* is the vector in the south. In some of the barren rocky regions, pits, which collect the rain, supply the only water available for man and beast. Anopheles breed in these pits, or *lokvas*, and covered cisterns are being substituted. In the salt marshes, near the sea, gambusia, which have been acclimatized to salt water in the laboratory, are doing good service. Above all, Paris green is giving excellent results.

The following method is used in Italy as a test for Paris green in water. Several centimetres of the water are put into a tube containing a culture of *Penicillium brevicaule* on potato. After 2 to 4 hours, a strong smell of garlic is given off. The reaction is positive in a dilution of 1 part in 1,000,000. The author's visit to Yugoslavia and Italy impressed on him the importance of minor anti-larval measures, which are gradually taking the place of quinine prophylaxis.

W. F.

DE BUEN (Sadi). Algunas consideraciones sobre la eficacia del tratamiento y de las medidas antilarvarias en la luche antipalúdica. [**On the Value of Treatment and of Antilarval Measures in combating Malaria.**]—Reprinted from *Arch. Inst. Nac. de Hig. de Alfonso XIII.* 1929. May. Vol. 6. No. 6. 23 pp. With 6 graphs in text.

The author surveys the results of treatment on a large scale and of anti-larval measures in limited areas in their effects on malarial prevalence for varying periods between 1921 and 1927 in parts of Spain. It is difficult to draw any general conclusions because in many instances the areas dealt with are very small, comprising under 50 inhabitants.

H. H. S.

SCHWETZ (J.), BAUMANN (H.) & CABU (F.). Sur la stérilisation des réservoirs d'hématozoaires paludéens par la quinine et le cinchona. [**The Sterilization of Reservoirs of Malarial Haematozoa by Quinine and Cinchona.**]—*Ann. Soc. Belge de Méd. Trop.* 1930. Mar. 31. Vol. 10. No. 1. pp. 95–102. [4 refs.] [Parasit. Lab., Stanleyville.]

Single daily doses of quinine, or of cinchona febrifuge, 4 to 8 grains, were given to school children at Stanleyville, where 100 per cent. are infected. It was evident that if one wished to obtain a radical cure and permanent prophylaxis, it would be necessary to continue the treatment indefinitely. The usual insurmountable difficulty of such methods was encountered, namely, the impracticability of making people take drugs regularly over a long period.

W. F.

D'HOOGHE (M.). L'action de la prophylaxie quinique chez les travailleurs Ruanda-Urundi à Ruashi. [**The Effect of Prophylactic Quinine on the Ruanda-Urundi Labourers at Ruashi.**]—*Bull. Méd. du Katanga.* 1930. Vol. 7. No. 2. pp. 42–43.

A dose of 1 gram of quinine three times a week was given to the labourers, and this brought about a considerable reduction in the number of cases admitted to hospital. The recruits, who were all infected before their arrival, were given half a gram every day, which was sufficient to maintain a state of equilibrium between them and their parasites.

W. F.

D'ANFREVILLE DE LA SALLE. Un procédé récent de lutte antipaludéenne. [**A New Move in the Antimalarial Campaign.**]—*Rev. Méd. et Hyg. Trop.* 1930. July–Aug. Vol. 22. No. 4. pp. 193–196.

The anopheles of Morocco breed in shallow stagnant water. A small, indigenous fish—*Cyprinodon fasciatum*—is actively larvivorous, but has the disadvantage of growing to such a size that the natives catch it for food.

Excellent results have been obtained in an experimental trial of imported *Gambusia holbrocki* which do not grow longer than a couple of inches. (See this *Bulletin*, Vol. 27, p. 641.)

W. F.

Jackson (R. B.). **Malaria and Mosquito Curtains in Certain Areas of Pahang West.**—*Malayan Med. Jl.* 1930. June. Vol. 5. No. 2. pp. 67–68.

Forty-seven children were examined in four villages occupied by Chinese, in which no anti-malarial operations had been undertaken. The spleen-rate was only 1·7 per cent., and enquiries showed that the villagers suffered very slightly from malaria, although *A. maculatus* was found breeding in the vicinity. By way of contrast, the spleen rate of 1,193 Malay children, in schools and villages, was 45 ; and the spleen rate of 155 Tamil children was 79. Dr. Jackson attributes the difference in the incidence of malaria to the use of the mosquito net by the Chinese [but one cannot help suspecting that some additional factor was concerned].

W. F.

Knowles (R.) & Gupta (B. M. Das). **Studies in Untreated Malaria. I. A Case of Experimentally Induced Quartan Malaria.**—*Indian Med. Gaz.* 1930. June. Vol. 65. No. 6. pp. 301–310. With 2 charts & 1 text fig. [18 refs.]

An Indian who was suffering from neurosyphilis was inoculated therapeutically with quartan malaria which caused what was almost certainly a primary infection. The attack was more severe than the natural disease ; on one occasion there were 43,600 parasites per cmm. ; in general, the number fluctuated between 6,000 and 10,000. In chronic relapsing cases the number is much lower than this. Gametocytes appeared at the very commencement of the fever ; they constituted about 6·2 per cent. of the parasites ; they appeared to live about 6 days, and they were rapidly destroyed by quinine. In the schizogony cycle, the free merozoite stage lasted about 1 hour ; the ring stage 17 hours ; the growing trophozoite stage 47 hours ; schizogony 6 hours ; mature rosettes 1 hour. The number of merozoites in each rosette was about 8. Some 95 per cent. of the merozoites failed to enter erythrocytes, and were apparently destroyed during each cycle ; this the authors believe to be due to the action of lysins in the plasma, for they were unable to find evidence of phagocytosis of the merozoites by the polymorphonuclear leucocytes, such as they have observed in cultures. The fever of invasion, in this case of primary quartan malaria, was irregular, as it is in primary benign tertian ; later on, typical quartan periodicity was established. Daily parasite counts were made by Sinton's fowl-corpuscle method. The formalinized suspension kept in perfect condition, in the ice-chest, for nine months. The films were fixed in methyl alcohol, pH. 6·8 ; washed in distilled water ; stained for 20 minutes in Giemsa, 1 drop to 1 cc. of distilled water ; washed with distilled water ; dried in air. The distilled water was adjusted to pH 7·2 with decinormal soda.

W. F.

ANDERSON (G. V. W.). **Clinical Aspects of Malaria in Kenya.**—*Kenya & East African Med. Jl.* 1930. July. Vol. 7. No. 4. pp. 88–99.

The error of diagnosing appendicitis when the abdominal pain is due to malaria only, can be avoided if it is remembered that peritonitis is accompanied by a tender, rigid, abdomen which cannot be relaxed. The abdominal pain which occurs in some cases of malaria is situated in one of two places: (1) Under the left costal margin; sometimes accompanied by tenderness in the upper part, where it coincides with a palpable spleen. (2) Along the right costal margin, often extending across the epigastrium. The pain in this area may be acute in blackwater fever. The tenderness, if there is any, is always over the liver; it never extends to the iliac fossa. These are the only kinds of abdominal pain which the author has seen in uncomplicated malaria. Their character and position in no way represent appendicitis or renal colic.

Attention is drawn to the insidious onset of cerebral malaria. It frequently begins as a confusional condition; the patient is not sufficiently alert to realize that he is seriously ill, or to remember to take his quinine, and his mental state often misleads his doctor to diagnose alcoholism or insanity until, 48 hours later, fatal coma occurs.

W. F.

GESTEIRA (Martagão). Le paludisme chez l'enfant. (Quelques réflexions touchant le problème thérapeutique.) [**Malaria in Children.**]—*Rev. Sud-Américaine Méd. et Chirurg.* Paris. 1930. Sept. Vol. 1. No. 9. pp. 923–933.

Dr. Gesteira considers that the dose of 10 centigrams of quinine for each year of a child's age is too small; a dose of 10 centigrams (1½ grains) will not cure a child of one year. Most of the cases of so-called quinine resistance in children he ascribes to the pusillanimity of the doctors. On the other hand, in children, there is but a narrow margin between the therapeutic dose and the toxic dose; there is an added danger in infants, because they cannot complain of the early toxic symptoms such as tinnitus. He tells some terrible stories of infants poisoned with overdoses of quinine, of abscesses in the buttocks, of convulsions, of parents attempting suicide because their children had been blinded by quinine. The technique of injection into the jugular vein is simple enough in infants, but he has abandoned the intravenous method because he has seen it followed by sudden death. Intramuscular injections are too often followed by abscess, no matter what precautions are taken. He has found SUZUKI's method of rectal administration of quinine, in 0·25 to 0·5 per cent. solution, very satisfactory in the three cases in which he has tried it.

W. F.

DE LUCA (Benedetto). L'emiplegia infantile da malaria. [**Malarial Hemiplegia in Infants.**]—*Policlinico.* Sez. Prat. 1930. Aug. 11. Vol. 37. No. 32. pp. 1171–1175. [13 refs.]

The author refers to ASCOLI who states that hemiplegia in malarial patients is common, but he maintains that if a distinction is made, as it should be, between hemiplegia in malarial subjects and hemiplegia due

to malaria, the latter is very rare. He records details of two cases very similar except that in one *P. vivax* was present, in the other *P. falciparum.* The former only need be given here :

A child of 3 years had suffered from malaria with several relapses from the age of 7 months. Subsequently they recurred and the day after admission to hospital the child had general convulsions during an attack (*P. vivax* was present in large numbers in the blood) more marked on the right side. The following day examination revealed complete right hemiplegia. Quinine was given by injection and by mouth. The paralysis remained unchanged for 20 days and then began to improve, and when the child left hospital 5½ weeks after admission there were no residual indications of the attack. The cerebrospinal fluid was normal and this fact together with the complete recovery put out of court the idea of any of the usual organic causes of the hemiplegia, such as cerebral haemorrhage or encephalitis.

H. H. S.

Trabaud (J.). La malaria, maladie convulsivante. [**Epileptiform Malaria.**]—*Bull. Acad. Méd.* 1930. May 27. 3rd Ser. Vol. 103. No. 21. pp. 575–578. [1 ref.]

Malaria resembles epilepsy in many ways : sometimes the first symptom of malaria is a fit, and fits are not at all uncommon in severe forms of the disease. More important than these convulsive attacks are the malarial psychoses, which resemble the psychoses of *petit mal.* For example, a sergeant-major of exemplary character contracted malaria in Damascus, and subsequently became insubordinate. On one occasion, he left his duty and went into the bazaar ; on another, he wandered off with his rifle, and lost it. A second N.C.O. who was suffering from chronic malaria boarded a motor car while he was in a state of automatism, and did not come to himself until he got to Beirut, where he was laid up for five days with an attack of malaria. The malarial psychoses resemble alcoholism very closely, but neither of these men drank much, and similar cases occurred among strict Mahomedans who drank no alcohol. Many men have suffered unjust punishment on this account, and the main object of this paper is to draw attention to the medico-legal importance of recognizing that impulsive automatic psychoses occur in malaria as they do in epilepsy.*

W. F.

Giglioli (George). **Malarial Nephritis. Etiological, Epidemiological and Clinical Studies on Bright's Disease in British Guiana, 1922-1929.**—*British Guiana. Rep. of the Surgeon General for the Year* 1929. Appendix II. pp. 71–86. [18 refs.]

In this appendix to the Surgeon-General's annual report, Dr. Giglioli gives a short synoptic outline of his observations on Bright's disease, as published in the monograph entitled " Malarial Nephritis " which was reviewed in this *Bulletin* (Vol. 27, p. 508). Chronic nephritis, a condition for which British Guiana is notorious, occurs where and when chronic untreated quartan or benign tertian malaria prevail and persist. *P. malariae* is, in the main, responsible. There is absolutely no proof

* See also Anderson's *Malarial Psychoses and Neuroses* (1927), Oxf. Univ. Press, reviewed in this *Bulletin*, Vol. 24, p. 683.

that streptococcal infections or dietary deficiencies play any part in the causation of the disease. Albuminuria is rarely noted in treated cases of malaria, even if the treatment consists of quinine taken irregularly and at long intervals; long continued, unchecked fever is the cause. "During the last two years much has been said in the Colony about too much being spent on cure and too little on prevention, and measures are being taken to intensify on the latter, at the expense of the former." The author does not agree with this policy; he considers that mosquito control would be quite ineffective in the rural areas; he argues that, in malaria, treatment is a powerful means of prevention, and that systematic, competently-administered treatment is the only practical measure which can be undertaken in the present economical and educational stage of British Guiana. "By yielding immediate palpable results, it would moreover contribute to inspire new confidence in the people towards Public Health work, which many years of futile anti-mosquito campaigns have deeply shaken."

W. F.

Wolsky (M.) & Schewelewa (E. M.). Zur Frage der Nierentätigkeit bei Malaria. [**Renal Activity in Malaria.**]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1930. Oct. Vol. 34. No. 10. pp. 542–549. [21 refs.] [Malaria Station and Hospital, Samara-Slatoust Railway.]

In 76 cases of malaria investigated 50 showed various alterations in the functional activity of the kidneys. The following shows the relation to the malarial infection:—

15 cases of damage to renal function occurred in 23 cases of benign tertian.
6 cases of damage to renal function occurred in 10 cases of malignant tertian.
13 cases of damage to renal function occurred in 19 cases of quartan.

The authors conclude that probably in malarial areas cases of renal disease of uncertain etiology are often a result of chronic malarial infection; this may be the immediate and only cause, whilst in other cases it renders the kidneys more susceptible to infections, irritations, etc. [Giglioli in British Guiana records that chronic nephritis is found exclusively associated with the benign forms of malaria which are notorious for their greater tendency to chronicity and recurrence and it appears to be specifically related to *P. malariae* infection.]

E. D. W. Greig.

Lorando (N. I.). Néphrite et dégénérescence amyloïde d'origine palustre. [**Nephritis and Amyloid Degeneration of Malarial Origin.**]—*Bull. Soc. Path. Exot.* 1930. June 11. Vol. 23. No. 6. pp. 584–589.

A boy of nine who was under treatment for chronic subtertian malaria had a large quantity of albumen in his urine with a high concentration of urea in his blood, and he suffered from repeated attacks of coma. Post mortem, the kidneys were small and granular, the tubules were atrophied, and the glomerulae had undergone hyaline degeneration. The connective tissue was hypertrophied and infiltrated with leucocytes. The glomerulae and the small arterioles gave a positive amyloid reaction with gentian violet. Amyloid degeneration was also present in the liver and the spleen.

W. F.

Eyermann (Charles H.) & Strauss (Arthur E.). **Malarial Urticaria and Allergy.**—*Jl. Allergy.* 1930. Jan. Vol. 1. No. 2. pp. 130–135. With 1 chart. [30 refs.] [Med. School, Washington Univ., & Jewish Hosp., St. Louis, Mo.]

A woman was taken ill suddenly with epigastric pain and vomiting which was relieved by morphia, but recurred on the following day. On the third morning, she had another attack accompanied by a rise of temperature and urticaria. No malaria parasites were found. Similar attacks with urticaria occurred on the fourth, fifth, and sixth days. On the seventh day, she had a chill with the urticaria, and, on the eighth, an enlarged spleen and a mixed tertian infection were discovered. All the symptoms disappeared when quinine was given. It is suggested that the urticaria was an allergic phenomenon due to infestation with malaria parasites, and analogous to the allergy which develops in hydatid disease. (See also Ferrao, P., Vol. 27, p. 206.)

W. F.

Craste. Un cas autochtone de paludisme à *Plasmodium vivax*. [**An Indigenous Case of Benign Tertian.**]—*Bull. Soc. Path. Exot.* 1930. July 9. Vol. 23. No. 7. pp. 726–727. [Civil Hosp., Bayonne.]

A nun who had lived for many years in a convent near Cambo, in the region of Bayonne, developed benign tertian malaria, with very high fever. She had never been abroad, but *A. maculipennis* breeds in the neighbourhood, and probably carried the infection from an old soldier who lived near the convent. The patient became very ill before malaria was diagnosed, and the case is reported as a warning to medical men in the neighbourhood.

W. F.

Micheletti (Ettore). Il contenuto parassitario degli organi nelle forme malariche perniciose. [**The Parasite Content of Organs in Subtertian Malaria.**]—*Ann. di Med. Nav. e Colon.* 1930. July–Aug. Year 36. Vol. 2. No. 1/2. pp. 365–395. With 8 figs. on 4 plates. [9 refs.] English summary. [Inst. of Path. Anat., Univ., Rome.]

The author made careful autopsies on five patients dying from subtertian malaria and submitted to histological examination portions of the spleen, liver, kidney, heart, brain, cerebellum and skin. In each of these he observed the arteries, capillaries and veins to determine the parasite content, the results of phagocytosis or destruction of the plasmodium in the vascular endothelium, and the local damage, if any, caused by the parasite or its residues. All five showed almost the same conditions, the differences being of degree only, not qualitative, so that the findings can be summarized. It is common to hear the statement "there was an accumulation of parasites in the spleen," but to the author's surprise the number of actually parasitized red cells in the spleen was small; the remnants of cells and damaged fragments were many, and he concludes that the spleen (and the findings in the liver were similar) is not the depôt of parasitized corpuscles, but acts rather as a filter retaining damaged corpuscles and remains of parasites which themselves set up inflammatory reaction in the spleen itself (and liver). In the bone marrow (rib and femur) there was a greater accumulation than in liver or spleen, but in some the gametes were many, the trophozoites few. In the brain and cerebellum the parasites did appear to accumulate in the capillaries, sometimes but not invariably causing damage to the nerve cells and neuroglia. As regards the heart, the

veins of moderate calibre contained many parasites, but injury to the capillary endothelium was not seen ; he infers, therefore, that the heart is merely a means of passing on the parasit s through the capillaries to the veins and general circulation. The kidneys showed a cumulation of parasites in the glomeruli, pigmentation of the capilla. y endothelium, and in many sections the tubular epithelium showed nec osis and granular degeneration ; that is, the kidneys are organs where the parasites accumulate and cause injury to the surrounding cells (capillaries and tubules), but also act in part as " organs of passage."

H. H. S.

KENYA AND EAST AFRICAN MEDICAL JOURNAL. 1930. Sept. Vol. 7. No. 6. pp. 161–175. **The Treatment of Malaria.** [GILKS, BURKITT, and others.]

The doctors of Kenya are not unanimous as to the way in which quinine should be given, and this discussion on treatment reveals a wide divergence of opinion. Dr. Gilks, who opened the debate, recommended intramuscular injections as the routine treatment for adults, because, whatever the type of case, he considered that there was no guarantee that the quinine would be absorbed. [It is a very simple matter to test the urine by adding a few drops of Mayer's reagent.] Dr. Burkitt, who followed Dr. Gilks, said that he never used intramuscular injections unless he was forced to do so, and that, in his opinion, it was a very bad practice.

W. F.

BASS (C. C.). **The Treatment of Malaria, with Some Reference to recently promoted New Remedies.**—*Jl. Amer. Med. Assoc.* 1930. Oct. 4. Vol. 95. No. 14. pp. 988–991. [12 refs.] [Med. School, Tulane Univ., New Orleans.]

The author considers that the cinchona alkaloids, especially quinine, constitute the only specific remedy for malaria. Arsphenamine, stovarsol, and other arsenical preparations, have some non-specific effect, but they are so far inferior to quinine that their use is on the decline.

" The use of these preparations as remedies for malaria seems to be more closely related to the appeal for intravenous therapy than to the cure of malaria . . . any fluid, even salt solution, given directly into the blood stream damages the blood cells to some extent and tends to make them an unfavourable soil for malaria parasites to grow in. [See MASSIAS below.] . . . Plasmochin has far less effect on malaria than has quinine, and its toxicity, which is associated with methaemoglobinaemia, makes its routine use questionable. . . . I am sure that malaria can be cured with plasmochin as with many other things, but the question would naturally arise at the present time as to whether the price paid is worth the results." [? whether the results are worth the price paid.]

In spite of the well-attested evidence in proof of the gametocidal power of plasmoquine, Dr. Bass appears to doubt it; he suggests that many of the statements and claims to this effect are not based on controlled observations, but are simply repetitions of similar claims made by others. He also considers that further confirmation of the specific action of plasmoquine on the reproductive power of gametes is requi ed. (See United Fruit Company's Report, this *Bulletin* above, p. 106, and BARBER and others, Vol. 26, 1929, p. 939.)

W. F.

HOANG-SU. La quinine en injection intraveineuse dans le traitement du paludisme. [**Intravenous Quinine in the Treatment of Malaria.**] —*Bull. Soc. Méd.-Chirurg. Indochine.* 1929. Dec. Vol. 7. No. 12. pp. 684–687.

The author treated 1,086 cases of malaria with intravenous quinine at Phu-diên, in Indo-China. He gave 4,343 injections in five weeks, amounting, in all, to 29 litres of a 1/20 solution of quinine. There were no serious after-effects. The patients experienced a sensation of heat, tinnitus and giddiness immediately after the injections, but these symptoms soon passed off except in a few debilitated people who were obliged to lie down for the remainder of the day. The routine treatment was 1 gram of quinine by the mouth, and 0·25 centigrams intravenously, every day for four days; in robust individuals, double the quantity of intravenous quinine was given. It was put up in ampoules with the following prescription :—

Quinine	0·25 cgm.
Arrhenal	0·05 cgm.
Sérum physiologique	5 cc.

In robust patients, ampoules were used which contained double this quantity of quinine. [In the average case of malaria, when oral quinine is absorbed, it does not appear necessary, or right, to inject it intravenously.]

W. F.

MASSIAS (Charles). Le quiniostovarsol dans le traitement du paludisme à *Plasmodium vivax* et *Plasmodium praecox*. [**Quiniostovarsol in the Treatment of Malaria.**]—*Bull. Soc. Path. Exot.* 1930. June 11. Vol. 23. No. 6. pp. 651–663. With 17 text figs. [10 refs.]

This drug is of great value in chronic malaria with anaemia. The quinine destroys parasites, while the arsenic rapidly improves the general condition of the patient. It does not prevent relapses. The dose for an adult is 1 gram daily for 10 days, and ten-day courses are repeated over a period of 2 months, with intervals of 7 days, or more, between them. Doses of 0·5 gram can be given to children between 5 and 10 years old. (See C. C. BASS above.)

W. F.

WALLACE (R. B.). **The Use of Plasmochin Compound and Quinine with Indian Labour under Estate Conditions in Malaya.**—*Malayan Med. Jl.* 1930. Mar. Vol. 5. No. 1. pp. 11–25. With 2 figs. & 5 charts. [3 refs.]

These experiments were carried out on a malarious rubber estate where the elimination of all breeding places within range of flight of the dangerous mosquito (*A. maculatus*) was impracticable on account of the numerous hills and ravines, and the rocky nature of the country. Mosquito larvae were carried down the streams from the hills for long distances, and " to deal with this source of infection would necessitate oiling of the whole length of the streams—a distance of several miles." The daily adult dose employed in treatment during the first week was 5 tablets of Plasmoquine Co. in the morning, and, in the evening, 2

tablets along with 10 grains of quinine. Each tablet contained 0·01 grams of plasmoquine and 0·125 grams of quinine. The patients were thus given about 23 grains of quinine daily in addition to 0·07 grams of plasmoquine. During the second week, the dose of plasmoquine compound was reduced to 4 tablets daily. During the third, fourth, and fifth weeks, the treatment was given on three days in each week instead of every day. The result was a fall in the sick rate and the parasite rate, accompanied by definite improvement in the health of the coolies as demonstrated by a rise in the haemoglobin rate and a better daily out-turn of labour. The sections of the estate where treatment was being carried out remained healthy, while other sections were suffering from an epidemic of malaria. No serious toxic effects were observed and plasmoquine compound was subsequently used as part of the regular field treatment without special medical supervision. The cost was considerably higher than treatment with quinine alone, but the extra expense was justified by the result. [Much smaller doses of plasmoquine have been found useful on the United Fruit Company's plantations. See Deeks above, p. 108.]

W. F.

Ciuca (M.), Irimesco (G.), Ballif (Léon), Franke (M.), Constantinesco (N.) & Vieru (M.). Recherches sur l'action thérapeutique de la plasmochin pure dans le paludisme. [**Experiments with Plasmochin** *sine* **Quinine.**]—*Arch. Roumaines Path. Expérim. et Microbiol.* Paris. 1930. Mar. Vol. 3. No. 1. pp. 85–94. [Izolarea Hosp., Milit. Hosp., & Socola Hosp., Jassy.]

One hundred and nine natural, and six experimental, infections were treated in hospital with doses of plasmoquine not exceeding 0·06 to 0·08 grams daily. Toxic symptoms necessitated the suspension of treatment in 60 per cent. Doses as small as 0·02 were sometimes toxic, even when given with quinine. Relapses were frequent. The authors conclude that plasmoquine cannot take the place of quinine, that it should never be given without quinine, and that its administration should always be under direct medical supervision.

W. F.

Leisermann (L. I.). Ueber die parasitozide Wirkung des Plasmochins. [**Parasiticidal Action of Plasmochin.**]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1930. June. Vol. 34. No. 6. pp. 309–319.

The blood was examined in 20 cases of malaria, both malignant and benign tertian, in order to observe the action of plasmochin on the various phases of the parasites of malaria. In benign tertian infection it was found that the schizonts were the most resistant to the action of plasmochin. In malignant tertian infection the rings disappeared towards the middle of the second day, but the gametocytes were observed for three to four days after commencing plasmochin ; as the schizonts were never seen in this infection it was not possible to say what happened to them. Pure plasmochin and plasmochin compound were administered. [The quantity of plasmochin given is not stated. Quinine as well as plasmochin is contained in plasmochin compound.] From these observations the author is convinced of the specific parasiticidal action of plasmochin.

E. D. W. Greig.

Mynssen (G. E. H. Verspyck). Behandlung von Malaria tropica mit Chinin in Kombination mit Plasmochin. [**Quinine and Plasmochin Treatment of Malignant Malaria.**]—*Acta Leidensia* (*Scholae Med. Tropicae*). 1929. Vol. 4. pp. 196–212.

From August 1927 to August 1928, 66 patients suffering chronic malaria—54 malignant, 12 benign tertians—were treated in the Tropical Diseases Hospital at Rotterdam. The author concludes that in cases showing crescents in the blood, plasmochin, in combination with fairly strong doses of quinine, is a powerful gametocidal agent. [The proof correcting of this paper is indifferent ; thus it is stated, "I never gave more than 40 g. Plasmochin per day," and the " number of leucocytes sank to 1600000."]

E. D. W. Greig.

Borchardt (W.). Ueber die chemo-therapeutische Wirkung von Chinin, bzw. Plasmochin in vitro auf *Proteosoma praecox* (Vogelmalaria). [**Action *in vitro* of Quinine and Plasmochin on *Proteosoma praecox* (Bird Malaria).**]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1930. July. Vol. 34. No. 7. pp. 360–364. [6 refs.]

The *in vitro* experiments showed that the minimum doses and the minimum time interval required to kill the parasites were : 0·5 mgm. quinine hydrochlor. per 1 cc. infected blood, 4 mgm. quinine bihydrochlor. and 0·2 mgm. plasmochin, after 5 hours in the ice chest. These results suggest a direct attack by the drug on the parasites of bird malaria. The author considers that the action of quinine and plasmochin on the parasites of human malaria should be studied in a similar manner.

E. D. W. Greig.

Philaire. Contribution à l'étude de l'action thérapeutique du bleu de methylène dans le paludisme. [**The Action of Methylene Blue in Malaria.**]—*Ann. de Méd. et de Pharm. Colon.* 1930. Jan.–Feb.–Mar. Vol. 28. No. 1. pp. 48–54.

The author recommends the administration of methylene blue in cases where quinine fails to act, in cases of oligocythaemia with fragility of the corpuscles, and in pernicious attacks. No mention is made of any blood examinations to control its effects on the malaria parasites. Intramuscular injections of 2 cc. of a 2·5 per cent. solution were given daily, in association with quinine. In pernicious attacks an intravenous injection of 5 cc. was given at once.

Administration by the mouth was abandoned because it caused severe vomiting, violent diarrhoea and vertigo. Special precautions were taken in cases of nephritis and severe cachexia.

W. F.

Chopra (R. N.) & Knowles (R.). **The Action of Opium and Narcotine in Malaria.**—*Indian Jl. Med. Res.* 1930. July. Vol. 18. No. 1. pp. 5–13. [2 refs.] [School of Trop. Med. & Hyg., Calcutta.]

In the report of the Opium Commission of 1895, it was stated that the habit of taking opium formerly prevailed in excess in the low-lying marshy districts of England, where its consumption was very large in the days when malaria was prevalent. It was implied in the report that the drug had an anti-malarial action. The authors found that opium had neither a prophylactic nor a curative effect.

Narcotine is a bitter crystalline alkaloid ; in some Indian opiums the amount of narcotine is double that of morphia. Several reports were

issued, in the past, stating that it was a cure for malaria, and it was regularly supplied from Government factories until 15 or 20 years ago when quinine became cheaper. The authors tried its effects on several cases of malaria (tertian, subtertian and quartan infections), and came to the conclusion that, even in doses of 10 to 15 grains daily, it had no effect on the parasites or the fever.

W. F.

GUELIADOW (N. B.). [**Application of Calcium Treatment in the Therapy of Malaria.**]—*Trop. Medicine & Veterinary.* 1930. Vol. 8. No. 3. pp. 7–11. [In Russian.]

The author has applied calcium treatment in at least twenty-nine cases of malaria in which quinine produced various complications. In all these cases and in those of quinine-idiosyncrasy the after-effects of the drug were successfully eliminated. Particulars of treatment are not given, but it is said that on the appearance of symptoms due to quinine it is unnecessary to discontinue the use of the drug if oral administration of 10–20 per cent. calcium chloride in doses of one table-spoonful 3–4 times a day after meals is resorted to.

C. A. Hoare.

VAN DEN BRANDEN (F.). Le produit de broyage des graines de Picralima Klaineana (Pierre) dans le traitement du paludisme. [**The Powdered Seeds of** *Picralima Klaineana* **in the Treatment of Malaria.**]—*Ann. Soc. Belge de Méd. Trop.* 1930. June 30. Vol. 10. No. 2. pp. 123–128. [4 refs.] [Leopoldville Lab., & School of Trop. Med., Brussels.]

It has been stated that the seeds of this plant are a remedy for malaria. As much as 2·5 to 4 grams were given to five children without curing the subtertian malaria from which they were suffering. Four boys, 12 to 17 years of age, were given 3 or 4 grams a day, but totals of 22, 21, 19 and 17 grams, respectively, had no action on their subtertian infections. There were no toxic symptoms. The author considers that further trials should be made with larger doses of the powder, and also with an alcoholic extract.

W. F.

HASLÉ (G.) & NGUYEN-DUY-HA. Traitement des splénomégalies chroniques paludéennes par le sérum Normet médical. [**The Treatment of Chronic Malarial Splenomegaly with Normet's Serum.**]—*Bull. Soc. Méd.-Chirurg. Indochine.* 1930. Apr. Vol. 8. No. 4. pp. 308–313. With 4 figs.

Two patients with enormous spleens were treated by injections of 10 cc. of Normet's serum, with intervals of 10 days between the doses. After some three months treatment, the splenomegaly had almost disappeared, and, in one case, there was an improvement in the number of red cells and in the percentage of haemoglobin.

W. F.

TWITCHELL (Edward W.). **Spontaneous Rupture of Spleen—following Malaria Therapy for General Paresis.**—*California & Western Med.* 1930. July. Vol. 33. No. 1. p. 512.

A patient with general paralysis, "in a stage of rather marked mental dilapidation," was treated by the inoculation method. After 18 paroxysms of fever, he was given 10 grains of quinine. Shortly afterwards he vomited and collapsed. His abdomen became distended and filled with blood, and he died on the third day. A tear, 18 cm. long, was found in his spleen.

There were numerous gas spaces in the organ, and a Gram-positive bacillus (*Cl. welchii*), but no malaria parasites were seen.

W. F.

Speierer (Carl). Rezidivierende Impfmalaria und deren Behandlung. [**Relapsing Inoculation Malaria and its Treatment.**]—*Dermat. Woch.* 1930. July 5. Vol. 91. No. 27. pp. 980–983. [8 refs.] [Dermat. Clinic & Polyclinic, Univ., Munich.]

Two cases of inoculation malaria are described in which relapses took place. The relapses were not controlled by active quinine treatment. Accordingly the author adopted a combination of three methods of treatment which had proved successful in cases of relapse in natural malaria. The methods were : (1) Exposure of the whole body to sun's rays followed by administration of quinine. (2) The application of X-rays over the spleen with or without subsequent quinine administration. (3) Combined administration of Sod. cacodyl, strychnine and quinine. The author's scheme of treatment combines the 3 methods and extends over a period of 8 days. No further relapses occurred after the treatment.

E. D. W. Greig.

Henry (A. F. X.). Séroflocculation palustre. Methodes photométriques. [**Seroflocculation in Malaria. Photometric Methods.**] —*Arch. Inst. Prophylactique.* Paris. 1929. Vol. 1. No. 4. pp. 341–350.

The author ascribes the histo-pathological lesions of malaria to the accumulation of two kinds of pigment derived from haemoglobin, namely the ochre-coloured ferruginous pigment and the melanin pigment. Considering it probable that these pigments would produce anti-bodies in the blood which might be of diagnostic importance in a flocculation serum test for malaria, he set out to search for substances which could be employed as antigens, in place of the malarial pigments which it was impracticable to obtain in a sufficient quantity. Accordingly he devised his ferroflocculation and melano-flocculation tests, which have already been described in this *Bulletin* (Vol. 26, pp. 940–942 ; Vol. 27. pp. 211–212).

He first tried a number of methylarsenates of iron as substitutes for the yellow pigment, but only one of them, a product made by Bouty under the name of Metharfer, gave satisfactory results. Subsequently, he found that the *Ferrum Albuminatum in lamellis*, prepared by Merck, was also useful. In some cases one salt, in some the other, gave the greater flocculation. As a substitute for the black pigment, he used a suspension of choroidal pigment ; details of its preparation were given in Vol. 26 of this *Bulletin*, p. 941. Dr. Henry strongly advises the use of a Vernes-Bricq-Yvon photometer in reading the flocculation reactions. A photograph of this instrument is given on page 281 of the first volume of the *Archives de l'Institut Prophylactique.*

W. F.

Pozzi (Arnaldo). La reazione di Henry nella malaria. [**The Henry Reaction in Malaria.**]—*Policlinico.* Sez. Med. 1930. Aug. 1. Vol. 37. No. 8. pp. 361–375. [13 refs.] [Inst. of Clin. Med., Univ., Rome.]

The reaction, both the melano- and the ferro-flocculation, was tried in 115 malarial patients and 25 controls suffering from various diseases such as cirrhosis of liver, gout, tabes, pleurisy. Of 15 cases of chronic malaria with splenomegaly, two only showing parasites in the blood,

both reactions were positive in all. Eighty cases of relapsing malaria with parasites were tested either during an apyrexial interval, during the fever, or between attacks. Forty-one of the first, 3 of the second and 9 of the third gave a positive with both forms of the test ; 1, 23 and 1 respectively gave a negative to both ; one in the apyrexial and one during the fever gave a positive melanoflocculation and negative ferroflocculation ; none gave the reverse of these. This is interpreted as 95 per cent. positive during an apyrexial period, 1·85 per cent. between attacks, and negative during the fever in 85 per cent. In a third group of 20 patients with a first attack, six were positive to both reactions in the apyrexial period, 2 in the interval between attacks and 1 only in the fever ; 5 in the apyrexial period reacted to the melanoflocculation, but not to the iron. Among these again none gave a positive ferro- and negative melanoflocculation. The latter is therefore the more sensitive.

H. H. S

Vialatte (Ch.) & Remontet (E.). Paludisme viscéral, prémunition et réactions de floculation d'Henry. [**Visceral Malaria, Premunition and Henry's Flocculation Reactions.**]—*Bull. Soc. Path. Exot.* 1930. June 11. Vol. 23. No. 6. pp. 590–594. [7 refs.]

Eleven north Africans who had been admitted to hospital for various reasons were examined by Henry's tests, with the result that eight were found positive. They had neither parasites in the blood nor fever, but their spleens were enlarged 2 to 4 finger-breadths. A hundred Senegalese soldiers, natives of west and central Africa, were also examined. They showed no signs of malaria, but they had undergone repeated infection as children. Sixty-seven of them gave positive reactions. As a control 48 young French soldiers were examined. They had been in Africa only a short time and none were known to have suffered from malaria. Only 3 gave positive results, and these had possibly had attacks of malaria masked by prophylactic quinine. It is evident that the reaction persists long after the disappearance of the malaria parasites and all other signs of malaria.

W. F.

Le Bourdelles (A. C. B.) & Henry (A. F. X.). A propos de la séro-floculation du paludisme. [**Sero-Flocculation in Malaria.**]—*Arch. Méd. et Pharm. Milit.* 1930. July. Vol. 93. No. 1. pp. 121–124.

In this note, Dr. Henry points out a mistake in some tables of malaria-flocculations published by him in the *Paris Medical* of June 23rd, 1928 (this *Bulletin*, 1929, Vol. 26, p. 383), where it was stated that 7 out of 69 syphilitic sera gave a positive reaction. This was a misprint ; neither syphilis nor haemo-cytoclastic diseases give positive reactions if the proper technique is followed. (See this *Bulletin*, Vol. 27, p. 211).

W. F.

Raybaud (A.). Le séro-diagnostic du paludisme : les réactions d'Henry. [**The Serodiagnosis of Paludism : Henry's Reactions.**]—*Marseille-Méd.* 1930. June 5. Vol. 67. No. 16. pp. 725–731.

This is a clear and concise account of Henry's reactions with a summary of the results obtained by different investigators.

W. F.

CHEREFEDDIN (Osman). Wassermannsche Reaktion bei Malaria. [**Wassermann Reaction in Malaria.**]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1930. May. Vol. 34. No. 5. pp. 282–285.

The Wassermann reaction was tested in 76 cases of malaria in Turkey, and was found definitely positive in 10, 13·2 per cent. All three species of malarial parasite were represented among the positives. Anti-malarial treatment produced a negative reaction in the course of one to two weeks.

E. D. W. Greig.

SINGH (Jamiat). **Urobilinuria and its Importance in Malaria.**—*Indian Med. Gaz.* 1930. July. Vol. 65. No. 7. pp. 390–391.

The presence of urobilin in the urine is, in the tropics, generally due to malaria. Examination for it is particularly useful in cases of malaria where quinine has been given and parasites cannot be found. It is present during the attack and for 3 or 4 days after the fever. The following tests are recommended.

(1) Add 5 drops of a 3 per cent. solution of paradimethylaminoazobenzaldehyde, in 50 per cent. hydrochloric acid, to 5 cc. of urine. A red colour shows that urobilin is present in abnormal amount.

(2) To 5 cc. of urine add 2 drops of Lugol's solution (Iodine 5 ; pot. iod. 10 ; water 100), and 5 cc. of a saturated solution of zinc acetate in absolute alcohol. Filter. A green fluorescence indicates urobilin.

(3) Acidify the urine with hydrochloric acid, extract with amyl alcohol. Examine with the spectroscope. A band in the green indicates urobilin. (See this *Bulletin*, 1928, Vol. 25, p. 146. MORISHITA and others.)

W. F.

PINELLI (Luigi). Resistenza globulare nelle epatosplenomegalie di origine malarica. (**Erythrocyte Resistance in the Hepato-Splenomegalies of Malarial Origin.**)—*Riv. di Malariologia.* 1930. Jan.–Feb. Vol. 9. No. 1. pp. 40–52. With 1 chart. [39 refs.] [English summary (7 lines) p. 95.] [Inst. of Path. & Clin. Med., Univ., Sassari.]

The study of the resistance of red corpuscles to haemolysis in malaria is not new, but records are far from numerous. The occurrence of a large number of cases in Sardinia afforded an opportunity for more intensive investigation. For dilution the author did not use the customary oxalate of sodium or potassium in sodium citrate because he found that this tends to bind the calcium more firmly and increase the fragility of the corpuscles ; he used instead isotonic saline. He examined the blood of 20 patients with enlarged liver and spleen due to malaria and found an increase of resistance. He explains this by postulating a removal from the circulation of a considerable proportion of the most fragile erythrocytes while the blood-forming organs react by pouring into the circulation new corpuscles having a degree of resistance above the normal.

H. H. S.

STRADOMSKY (B. N.), PETROWSKY (I. N.), POPOW (W. W.) & RUDNEW (G. P.). Ist es möglich, die menschliche Malaria künstlich auf Versuchstiere zu übertragen? [**Possibility of Transmission of Human Malaria to Experimental Animals.**]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1930. Sept. Vol. 34. No. 9. pp. 515–521. [Therap. Clinic, North Caucasian Univ., Rostov a.D.]

In September 1926, Masutaka JOSHINO published a preliminary communication on the successful transmission of the malarial parasite to various animals. As the work did not carry conviction to the authors for various reasons, they determined to control it by a further series of animal experiments. Thirty-five experiments in all were carried out in dogs and guineapigs. Blood from cases of benign and malignant infection was injected. As a result of their research the authors found that only in a very small number of cases and only in the first hours after subcutaneous or intravenous injection of malarial blood were malarial parasites seen in the blood of the animals and in very small numbers. Further investigations during 2–3 weeks never revealed the parasites in blood of the animals. They were unable to confirm the result of JOSHINO that experimental animals can be infected with human malaria.

E. D. W. Greig.

STERKIN (E. J.). Zum Studium der Regelung des Blutzuckerspiegels bei Malaria. [**Blood Sugar Level in Malaria.**]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1930. Sept. Vol. 34. No. 9. pp. 504–515. [19 refs.] [Ukraine Inst. for Protozool. Research, Kharkov.]

The author made blood sugar estimations in cases inoculated with benign tertian malaria and in cases of the natural infection. He concludes from his observations that: (1) A course of inoculation malaria (16 attacks) causes no alteration in the blood sugar regulating mechanism. (2) The alterations in the blood sugar level both during the attacks and in the intervals appear not to be specific for malaria since similar deviations occur in fever shown to have a different etiology. During the attack hyper-, normo- or hypoglycaemic values are observed. Most frequently the lowest values are at the beginning and end of the attack, but high levels may be observed at the peak. In the intervals the blood sugar level does not exceed the normal limit; hyperglycaemic values were only observed in 15 per cent. of the cases.

E. D. W. Greig.

KOPELOFF (Nicholas). **Inoculation Malaria: Sexual and Asexual Strains.**—*Amer. Jl. Med. Sci.* 1930. June. Vol. 179. No. 6. pp. 800–803. [3 refs.]

The use of an asexual strain of malaria in the treatment of general paralysis eliminates the possibility of accidental transmission by mosquitoes to other members of the community. A strain of benign tertian malaria, containing gametocytes, was inoculated into 35 men and 88 women between May 1928 and August 1929. During the first six months, gametocytes were found in every case, and in about 70 per cent. of the slides examined. In the last nine months, there was considerable reduction, and, in some of the cases, no gametocytes appeared. This reduction was more pronounced in female patients than in males. The author concludes that " a sexual strain of malaria, upon

repeated human passage, loses its capacity to produce sexual forms." The inoculations were generally given intravenously. The actual number of passages is not clearly stated.

W. F.

Puntigam (Franz). Ein Beitrag zum Fieberverlauf der Impfmalaria bei syphilitischen Erkrankungen des Zentralnervensystems. [**Temperature Curve of Inoculation Malaria in Nerve Syphilis.**]—*Med. Klin.* 1930. Aug. 15. Vol. 26. No. 33 (1340). pp. 1221–1223. [20 refs.] [General Hosp., Vienna.]

In 187 patients suffering from nerve syphilis the author studied the effect of three different strains of malaria (*P. vivax*) on the course of the fever. From his observations it became apparent that if a pure strain of malaria is injected once, a tertian type of fever is produced, even in general paralytics. A pure strain of malaria being defined by him as one from a case which had been inoculated once only, had had no previous malarial infection, and had received no quinine during the fever. A possible influence of the condition of general paralysis on the course of the fever was not established.

E. D. W. Greig.

Wendlberger (Julius). Impfmalaria und Isoagglutination. [**Inoculation Malaria and Isoagglutination.**]—*Wien. Klin. Woch.* 1930. July 24. Vol. 43. No. 30. pp. 932–935. [16 refs.] [Dermat. Clinic, Univ., Graz.]

As the result of three years' investigation on the connexion between blood grouping and inoculation malaria the author reaches the following conclusions: (1) The incubation period is twice as long in incompatible as in compatible blood groups. (2) The quotidian type of fever is much more frequent in compatible whilst the pure tertian type occurs almost always in incompatible blood groups. (3) The initial fever is much more frequent, of longer duration, and greater intensity in compatible blood groups. (4) Transfusion accidents, in the form of rise of temperature, rigor, sickness, difficulty of breathing, occur only in incompatible blood groups. [See this *Bulletin*, Vol. 24, p. 754.]

E. D. W. Greig.

Green (Richard). **Observations on Some Factors influencing the Infectivity of Malarial Gamete Carriers in Malaya to** *Anopheles maculatus*.—*Bull. Inst. Med. Res. Federated Malay States.* 1929. No. 5. 41 pp. With 2 coloured charts. [40 refs.]

Is it worth while attempting to reduce malaria generally throughout the Malay States, by the drug treatment of human carriers of gametocytes? Comparatively few of these carriers come into the hospitals for treatment, those who do come will not stay there after their symptoms have been relieved, and Dr. Green concludes that the general adoption of gamete carrier control in Malaya does not appear to be justified at present. (See United Fruit Co. Report, this *Bulletin*, Vol. 27, 1930, p. 186.) On the other hand, he considers that this method, in conjunction with the anti-malarial measures now in force, may be effective on estates and in small, easily-controlled areas.

The conditions bearing on the infection of the mosquito by man were investigated. Laboratory bred specimens of *A. maculatus*, the principal

malaria-carrying species of inland districts, were fed on 39 cases carrying gametes of *P. falciparum*, 20 cases with gametes of *P. vivax*, and 21 cases with gametes of *P. malariae*. Each mosquito had one feed only. *A. maculatus* proved readily susceptible to infection with *P. falciparum* and *P. vivax*; sporozoites were found in 74·3 per cent. of the former infections, and 62·5 per cent. of the latter. Very different results were obtained in the case of *P. malariae*, and it seems doubtful if *A. maculatus* can transmit quartan malaria; batches of 10 were fed on twenty patients, but sporozoites developed in none of the mosquitoes though oöcysts were found in a few of those which had fed on two of the cases. No true correllation was found between the number of gametocytes in a malaria patient's blood, and his power to infect mosquitoes. It appeared, however, that "the minimum number of gametes necessary to infect *A. maculatus* was, in the case of *P. falciparum*, one to 200 leucocytes, or 42 per 1 cmm. of blood; in the case of *P. vivax*, one to 1,000 leucocytes, or 10 per 1 cmm. of blood; and with *P. malariae* one to 330 leucocytes, or 27 per 1 cmm. of blood." In several cases patients with relatively few gametocytes were infective, while others, with many more in their blood, were not so. On this account a number of other conditions was investigated, such as the temperature of the patient, the presence of trophozoites, variations in the haemoglobin content, the number of leucocytes, the blood group, enlargement of the spleen. None of these proved to influence infectivity for the mosquito except, possibly, the last; for enlargement of the spleen was more common among cases which failed to infect *A. maculatus*. Various authorities have supposed that the proportion of male to female gametes is a factor in infectivity. Dr. Green found no evidence of this in subtertian or quartan malaria, but in benign tertian he considered it possible that there was less infectivity when the female gametocytes were greatly in excess of the males. He did not find that quinine treatment of the human host impeded the development of the gametes in the mosquito. "The viability of the gametes of *P. falciparum* is not affected by past or recent quinine treatment. As distinct from reducing the number of gametes in the blood, it is somewhat doubtful whether, in addition, quinine affects the viability of the gametes of *P. vivax* and *P. malariae*."

W. F.

Aragão (Henrique de Beaurepaire). [In Portuguese & English.] Evolução dos gametos do *Plasmodium falciparum*. (Nota preliminar.) **Evolution of the Gametes of** *Plasmodium falciparum*. (**Preliminary Note.**)—*Mem. Inst. Oswaldo Cruz.* 1930. Vol. 24. No. 2. In Portuguese pp. 41–48. With 42 coloured figs. on 1 plate. [8 refs.] In English pp. 49–56. With 42 figs. on 1 plate. [8 refs.]

The author studied the evolution of the gametes in subtertian malaria by means of spleen puncture. The films were allowed to dry, were fixed in alcohol, and stained with Giemsa. An excellent coloured plate is given. The early male gametes are small solid bodies without vacuoles and, as they become older, the resemblance to quartan parasites increases. The young female gametes are very narrow protoplasmic ribbons, stretched across the corpuscles like quartan bands; they carry a spot of chromatin at one end, or drawn out along the edge.

W. F.

Row (R.). **Further Observations on the Morphology of *Plasmodium falciparum* with Special Reference to the Findings in Two Fatal Cases of Malaria.**—*Indian Jl. Med. Res.* 1930. July. Vol. 18. No. 1. pp. 221–225. With 8 figs. (3 coloured) on 2 plates. [1 ref.] [Grant Med. College, Byculla, Bombay.]

The reduction in the number of merozoites within the schizont and the subsequent formation of gametocytes appear to occur more rapidly in mixed infections. In a mixed culture of *P. falciparum* and *P. vivax*, in glucose ascitic fluid, the subtertian schizonts developed normally; but, on subculture, the next generation contained no more than four merozoites per schizont, and further subculture failed. It is suggested that mixed infections, by favouring the production of gametes, may be responsible for the presence of carriers in endemic areas.

In a fatal case, parasites were found in almost every cell of the capillaries of all the internal organs except the liver. The parasites had probably undergone a rapid and uncontrolled multiplication when the patient was dying, and the merozoites had invaded almost every blood-cell. At the same time they had undergone morphological changes characterized by shrinkage of the cytoplasm, destruction of the chromatin, and precipitation of haemozoin within their bodies; consequently they appeared as dark brown dots surrounded by a thin rim of protoplasm.

W. F.

Dominici (Ada) & Rocca (Giuseppe Cascio). Sulla coltura "in vitro" dei parassiti malarici (*Plasmodium vivax* e *P. falciparum*). (**On the Culture "in vitro" of the Malarial Parasites** (*Plasmodium vivax* **and** *P. falciparum*.)—*Riv. di Malariologia.* 1930. Mar.–Apr. Vol. 9. No. 2. pp. 120–129. With 8 figs. on 1 plate. [22 refs.] [English summary pp. 205–206.] [Hyg. Inst., Univ., Palermo.]

The authors survey previous methods of cultivation of the plasmodia of malaria and find that a modification of Row's technique gives the best results. Their method is as follows:—

Blood is taken from a patient by venepuncture and 4–5 drops are placed in small tubes with a flat base containing 1 cc. of human serum inactivated by heating to 56° C. for half an hour and 2 drops of 50 per cent. dextrose. These are then placed in larger tubes [apparently Buchner's tubes] for anaerobic cultivation at 37° and 24°–26° C. When a portion is withdrawn for examination after 48 hours, a few drops of fresh defibrinated human blood is added. Attempts to cultivate in a current of air were unsuccessful.

After 48 hours nearly all the parasites had sporulated. Microphotographs well reproduced show the development at different intervals of incubation. The results were equally good at 37° C. and at 24°–26° C. The addition of the small quantity of fresh blood enables the cultivation to be renewed, otherwise the plasmodia rapidly die out.

H. H. S.

Neri (Francesco). La colorazione rapida dei parassiti della malaria col liquido di Giemsa. (**A Rapid Method for staining Malaria Parasites with Giemsa's Stain.**)—*Riv. di Malariologia.* 1930. Mar.–Apr. Vol. 9. No. 2. pp. 150–153. With 1 text fig. [1 ref.] [English summary p. 206.]

Leishman's stain carried in fluid state is liable suddenly to lose its staining properties, while if carried in form of powder there is the need also of a

balance, measures and solvent. Giemsa keeps better especially if glycerine be added. This, however, interferes with good fixation and, if used strong, Giemsa tends to precipitation and deposit. By mixing Giemsa's fluid with four times the quantity of methyl alcohol a product is obtained which will keep its properties for 15 days if placed in a yellow glass bottle. This is applied to the smear for a minute, then double the quantity of neutral distilled water for 5 minutes, after which the slide is washed in tap water. Of the three grades of slide, white, middle white, and French, the second is the best, since the others easily change with moisture yielding alkali to the preparation and thus interfering with the staining.

H. H. S.

SINTON (J. A.) & MULLIGAN (H. W.). **The Staining of Malarial Parasites in Blood Smears by the Iron-Haematoxylin Method.**—*Indian Jl. Med. Res.* 1930. Apr. Vol. 17. No. 4. pp. 1329–1332. [4 refs.]

The authors describe methods of staining in which the haemoglobin of the corpuscles and the malarial pigment are removed, so that the delicate structure of the parasites is demonstrated by the haematoxylin.

W. F.

MANALANG (C.). **The Preservation of Malarial Oöcysts and Sporozoites.**—*Philippine Jl. Sci.* 1930. Aug. Vol. 42. No. 4. pp. 481–487. With 11 figs. on 4 plates. [4 refs.]

This paper gives details of fixing and staining the stomachs and salivary glands of mosquitoes, and should be consulted in the original.

W. F.

KNIGHTS (E. M.). **The Influence of Blood Groups in Malarial Transfusions.**—*Jl. Lab. & Clin. Med.* 1930. July. Vol. 15. No. 10. pp. 980–981. [1 ref.]

In three cases of inoculated benign tertian malaria, in which the blood group of the donor and the recipient was the same, the incubation period was four days. In nine cases where the blood groups were different, the incubation period was seven to thirteen days.

W. F.

SPEIERER (Carl). Beziehungen zwischen Blutgruppenzugehörigkeit und Impfmalaria. [**Blood Grouping and Inoculation Malaria.**]—*Muench. Med. Woch.* 1930. Aug. 8. Vol. 77. No. 32. p. 1357. [7 refs.] [Dermat. Clinic, & Polyclinic, Univ., Munich.]

As a result of his observations the author concludes that it is possible to shorten the incubation period of inoculation malaria by using compatible blood groups, but it is essential also to inject at least 30 cc. of blood.

E. D. W. Greig.

DE ANDRADE (Alvaro) & PINTO (S. C. Ferreira). Incidencia da malaria no Brasil—Resultados já obtidos na prophylaxia da doença.—*Archivos de Hyg.* Rio de Janeiro. 1930. May. Vol. 4. No. 2. pp. 181–195. With 1 chart & 6 plans. English summary.

ARAFA. Malarial Dysentery, with Sigmoidoscopic Appearances and Treatment by Plasmochin Compound.—*Jl. Egyptian Med. Assoc.* 1930. Apr. Vol. 13. No. 4. pp. 110–123. [4 refs.]

BANERJEE (Kartik Chandra). Cholera and Malaria.—*Indian Med. Gaz.* 1930. May. Vol. 65. No. 5. pp. 275–276.

Basu (B. C.). Studies in the Anopheline Fauna and Malaria of Bhagalpur (Bihar and Orissa).—*Indian Med. Gaz.* 1930. July. Vol. 65. No. 7. pp. 375–379. With 6 text figs. [9 refs.]

Bernardo (Salud S.). Effect of Different Doses of Quinine Sulphate on the Decrease in Malarial Parasites in Peripheral Blood : Preliminary Report. —*Jl. Philippine Islands Med. Assoc.* 1930. Mar. Vol. 10. No. 3. pp. 132–137. [8 refs.]

Biswas (N. B. Ghosh). Three Cases of Toxaemia due to Ascariasis.—*Indian Med. Gaz.* 1930. Aug. Vol. 65. No. 8. pp. 441–442.

Boinet. Les reveils du paludisme ; leur importance clinique et thérapeutique. —*Marseille Méd.* 1930. Apr. 5. Vol. 67. No. 10. pp. 484–487.

Cawadas (Eus.). Les manifestations laryngologiques du paludisme latent.— *Ann. Malad. de l'Oreille, du Larynx, du Nez et du Pharynx.* 1929. Vol. 48. pp. 1112–1118.

Cazanove. Un ancien traitement du paludisme.—*Rev. Méd. et Hyg. Trop.* 1930. Jan.–Feb. Vol. 22. No. 1. pp. 23–31. [1 ref.]

Chatterji (C. D.). Malaria at Kapurthala Dispensary, Lucknow.—*Indian Med. Gaz.* 1930. Sept. Vol. 65. No. 9. pp. 492–494. With 2 graphs in text.

Ciaburri (Gennaro). Isto-patologia del sistema nervoso contrale nella malaria perniciosa.—*Arch. Ital. Sci. Med. Colon.* 1930. Sept. 1. Vol. 11. No. 9. pp. 533–543. With 6 text figs. [7 refs.] English summary. [Villa Torri Lab. of Colonial Path., Bologna.]

Corradini (Giuseppe). Die Malaria in Rovigno.—*Arch. f. Schiffs- u. Trop.-Hyg.* 1930. Sept. Vol. 34. No. 9. pp. 487–504.

Ehrmann (R.). Ueber eine malariaähnliche schmerzlose Form der Cholelithiasis.—*Med. Klin.* 1930. Sept. 19. Vol. 26. No. 38 (1345). pp. 1399–1400. With 1 chart in text.

Esquier (G.). Etude d'un réservoir de virus paludéen dans le région du Kroubs (département de Constantine).—*Arch. Inst. Pasteur d'Algérie.* 1929. June. Vol. 7. No. 2. pp. 181–183. With 1 map in text.

Franchini (Giuseppe). Appunti di malariologia nelle colonie italiane e sugli agenti trasmissori.—*Arch. Ital. Sci. Med. Colon.* 1930. July 1. Vol. 11. No. 7. pp. 396–398. English summary (4 lines) p. 399.

Frank (A. W.). Zur Plasmochindosierung.—*Arch. f. Schiffs- u. Trop.-Hyg.* 1930. July. Vol. 34. No. 7. pp. 397–398.

Ganora (Romualdo). Notizie sul polimorfismo della malaria in Eritrea ed in Somalia e sulla sua patogenesi e terapia.—*Arch. Ital. Sci. Med. Colon.* 1930. July 1. Vol. 11. No. 7. pp. 410–417. English summary (3 lines).

Haslé (Guy). Septicémie mortelle à pyocyanique chez un paludéen.—*Bull. Soc. Méd.-Chirurg. Indochine.* 1930. Mar. Vol. 8. No. 3. pp. 256–257.

Komendantov (V.). On the Epidemiology of Malaria in the Northern Caucasus. —*Rev. Microbiol., Epidémiol. et Parasit.* 1930. Vol. 9. No. 1. pp. 90–95. [In Russian. English summary pp. 134–135.]

Lages (João Kelly da Cunha). Da incidencia da malaria em Ribeirão das Lages, Estado de Rio de Janeiro. Luta anti-larvaria e plasmochino therapia prophylactica.—*Archivos de Hyg.* Rio de Janeiro. 1930. May. Vol. 4. No. 2. pp. 155–179. [1 ref.] English summary.

Maxwell (J. S.). The Risquez Test.—*Jl. Trop. Med. & Hyg.* 1930. Oct. 1. Vol. 33. No. 19. pp. 289–292.

Medulla (Candido). Sopra due casi di malaria primitiva osservati in Cirenaica. (Nota epidemiologica.)—*Arch. Ital. Sci. Med. Colon.* 1930. May 1. Vol. 11. No. 5. pp. 297–301. [15 refs.] English summary (6 lines). [Colonial Hosp., Benghazi.]

de Mello (Froilano). Sur l'emploi de la plasmoquine dans le traitement du paludisme.—*Bol. Ger. Med. e Farmacia.* Bastora. 1929. May–Aug. Ser. 13. Nos. 5–8. pp. 137–144. [Med. School, Nova Gôa.]

Murphy (R. A.). Some Observations on the Preparation and Examination of Thick Films for Malaria Parasites.—*Indian Med. Gaz.* 1930. June. Vol. 65. No. 6. pp. 325–326.

Papanastasiou (E.). Beitrag zur Kenntnis der neueren Arzneimittel gegen Malaria.—*Arch. f. Schiffs- u. Trop.-Hyg.* 1930. Aug. Vol. 34. No. 8. pp. 450–455.

Paterson (A. R.). General Antimalaria Measures : the Lesson of the History of Malaria in the United States of America.—*Kenya & East African Med. Jl.* 1930. Oct. Vol. 7. No. 7. pp. 180–189. [3 refs.]

Rombach (K. A.). Bijdrage tot de epidemiologie der malaria tertiana.—*Nederl. Tijdschr. v. Geneesk.* 1930. Oct. 11. 74th Year. 2nd Half. No. 41. pp. 5038–5039.

Sanders (J.). Bijdrage tot de epidemiologie der malaria tertiana.—*Nederl. Tijdschr. v. Geneesk.* 1930. Aug. 2. 74th Year. 2nd Half. No. 31. pp. 3889–3890.

Wolff-Eisner (A.). Ueber Epilepsie nach Malaria.—*Med. Klin.* 1930. Sept. 26. Vol. 26. No. 39 (1346). pp. 1452–1454.

It is with great regret that we record the death on Jan. 30 of Sir Andrew Balfour, K.C.M.G., who from 1913 to 1920 was a Sectional Editor (for Malaria) of the *Tropical Diseases Bulletin* and from 1921 to the date of his death a Member of the Honorary Managing Committee of the Bureau.

KALA AZAR.

Izar (G.). La leishmaniosi viscerale nell' adulto in Italia. (Parte conclusiva di due lezioni sul kala-azar dell' adulto.) [**Visceral Leishmaniasis in Adults in Italy.**]—*Riforma Med.* 1930. Oct. 6. Vol. 46. No. 40. pp. 1575–1576. [General Med. Clinic, Univ., Messina.]

The author discusses the recorded infrequency of kala azar in adults in Italy. He notes that from 1908 to 1923 Jemma had seen over 300 cases in children up to 12 years of age but not a single one in an adult. Longo, Abate and Di Cristina, all at clinics for children, had a similar experience. Following the discovery of a case in an adult and the interest aroused especially from the point of view of a possible confusion of the disease with malaria, eight cases in adults were recorded up to 1928 while in the two following years 20 cases were noted. The author believes that cases in adults are more common than statistics indicate. This is due very largely to the fact that the disease in adults differs from that in young children, while the statistics have been compiled almost exclusively from clinics for children's diseases.

C. M. Wenyon.

Timpano (Pietro). La leishmaniosi interna negli adulti in Italia. Note epidemiologiche e cliniche. [**Visceral Leishmaniasis in Adults in Italy.**]—*Policlinico.* Sez. Prat. 1930. June 9. Vol. 37. No. 23. pp. 837–838.

Apart from cases of infantile kala azar the author has observed the disease in adolescents and adults to the age of 32 years, and he maintains that there is no valid distinction between *Leishmania infantum* and *L. donovani*. Comparing the results of treatment with antimony potassium tartrate, the sodium salt, antimosan, and Zambeletti's antimonial injections, he finds that children are more tolerant of all of them than are adults, and that the sodium salt is tolerated by both more readily than the potassium salt. He believes that this is due in part to the physico-chemical state of the blood and in part to the condition of the vegetative nervous system. In vagotonic subjects the potassium compound causes sweating, salivation, vertigo and bradycardia, and vagotony is more marked in adults than in children. In sympathicotonics the potassium salt finds a more suitable application, since potassium acts as a stimulant to the vagus.

H. H. S.

Franco (Emilio Enrico) & Manai (Andrea). Le leishmaniosi in Sardegna. [**Leishmaniasis in Sardinia.**]—Reprinted from *Boll. Soc. Ital. Med. ed Igiene Colon.* (Supplement to Fasc. 4 of *Giorn. di Clin. Med.*). 19 pp. With 2 text figs. & 1 map. [12 refs.] [Inst. of Anat. & Path. Histology, Univ., Sassari.]

The authors review the eight cases of leishmania infection previously recorded in Sardinia, the first being one of oriental sore reported by Lombardo in 1921. Of the eight, three were cutaneous and five visceral. Two of the cutaneous and four of the visceral cases were indigenous; in the others the place where infection was contracted

was not determined. The authors now describe another visceral case in a boy of 13 years, who contracted the infection in Galtelli (on the east coast) or its immediate vicinity.

H. H. S.

GUALDI (A.). Il quinto caso di leishmaniosi viscerale osservato in Sardegna. [**The Fifth Case of Kala Azar observed in Sardinia.**]—*Pediatria.* 1930. Aug. 1. Vol. 38. No. 15. pp. 834–840. [17 refs.] [Inst. of Path. Med., Univ., Rome.]

Sardinia was considered to be free from kala azar till LURIDIANI and MARCIALIS in 1921 published an account of the first case in a youth 18 years of age. In 1925 DE VILLA described a second in an infant one year old, while MARCIALIS in 1928 described two further cases in boys from the village of Bitti. The author now records the fifth case in a boy of 13.

C. M. W.

NEUMANN (C. Zahra). **Infantile Leishmaniasis in Malta.**—*Jl. Trop. Med. & Hyg.* 1930. Nov. 1. Vol. 33. No. 21. pp. 318–321. With 2 charts in text. [Central Civil Hosp., Malta.]

Infantile kala azar was first recognized in Malta about 1910. Since the War the disease has appeared commoner, but this may be due to more accurate diagnosis. The author states that the disease attacks children exclusively and that the few cases described from adults by naval doctors have not been authenticated by spleen puncture. [This statement is certainly incorrect; see for example BASSETT-SMITH, this *Bulletin*, Vol. 5, p. 266 and Vol. 21, p. 251.] The youngest case seen was in a child seven months old and the oldest in one of eleven years. The majority are children just under to just over two years of age. Certain villages are endemic centres and in these many cases come from one part of the village, often from neighbouring houses of one street. Though the families are, as a rule, very large, few show more than one case. Clinically the cases are similar to those in other endemic areas. Treatment was formerly carried out by intravenous injections of tartar emetic. Owing to the toxic effects of this drug and the liability of those receiving it to get bronchopneumonia, treatment with neostibosan was introduced. The drug can be given intramuscularly without any irritation and with a therapeutic effect equal to that of intravenous injection. The majority of children received 0·2 gm. at the third injection, a total quantity of 2·5 gm. being given in twelve injections in a period of six weeks. In twelve cases in a series of sixty, between twenty and twenty-four injections were necessary. Of these sixty cases seven terminated fatally, five from bronchopneumonia, one from diarrhoea and marasmus, and one patient, who was in a dying condition when seen, after the second injection. Noma has not been seen as a complication since neostibosan has been used, while bronchopneumonia is less frequent. Some cases were successfully treated by an intensive course of daily intramuscular injections of 0·15 gm. for ten days, and this, in the author's opinion, is the method of choice.

C. M. W.

Timofeewa (M. E.). [**On the Incidence of Visceral Leishmaniasis in Samarkand.**]—*Pensée Méd. d' Usbéquistane et de Turquménistane.* Tashkent. 1930. Vol. 4. No. 9–10. pp. 57–68. With 2 charts in text. [In Russian.]

During the last three years (1927–1929) 177 cases of kala azar have been recorded at the Samarkand Station of Tropical Medicine, Turkestan, the diagnosis being based on spleen puncture. On comparing these figures with those for the preceding three years it is seen that the incidence remained fairly constant varying from 54 to 64 cases per annum. It is noted, however, that a proportion of cases escape detection being diagnosed by private practitioners as malaria. Out of 38,211 children 1·3 per cent. were affected, the majority (0·7 per cent.) being under the age of three. Nationality seems to be of no importance. As regards sex, 62·2 per cent. were males and 37·8 per cent. females. The fatality in 1927–28 was 40·3 per cent., being greatest amongst children under three years old, and diminishing with age.

C. A. Hoare.

Adler (S.) & Theodor (O.). **The Behaviour of Insect Flagellates and Leishmanias in** *Phlebotomus papatasii.*—*Ann. Trop. Med. & Parasit.* 1930. July 8. Vol. 24. No. 2. pp. 193–196. [3 refs.] [Microbiol. Inst., Hebrew Univ., Jerusalem.]

The authors have already shown that when ingested by *Phlebotomus papatasii* various species of Leishmania differ in their behaviour. *L. tropica*, whether ingested from culture or from the sore, multiply, ascend the cardia and pharynx and in a few cases enter the proboscis. Of four strains of *L. donovani* of Mediterranean origin and two of *L. tarentolae* all behave like *L. tropica* with the exception of one strain of *L. donovani* which does not pass from the stomach. Two other strains of *L. donovani* from Naples produce a low infection rate, but the parasites when once established pass to the top of the cardia and attach themselves to the rhabdorium. Two Indian strains of this parasite behave similarly if ingested in sufficient quantities but the infection tends to die out. An abnormally short strain from China is restricted to the stomach even when as many as 8,000 parasites are ingested. Of two strains of *L. brasiliensis* one, a short form, remains in the stomach while the other ascends and attaches itself to the rhabdorium. *L. ceramodactyli* adopts a typically posterior position in the hind-gut, but in addition flagellates ascend to the cardia, attach themselves to the rhabdorium and even enter the pharynx if the infection is a very heavy one. The behaviour of *L. tropica* and *L. ceramodactyli* is regarded as indicating specific development in the fly. That of the other strains is interpreted as proving that *P. papatasii* is not the normal vector, for ascent to the cardia and pharynx only occurs when very large infective doses are ingested, whereas with *L. tropica* this is independent of the dose. A strain of *L. agamae* behaves in an irregular manner, sometimes ascending to the cardia and at others descending to the hind-gut. A number of insect leptomonads—*Herpetomonas culicidarum*, *H. oncopelti*, *H. lygaeorum* and *H. muscidarum* and one from a plant *H. oncopelti*—have been studied in *P. papatasii*. These persist in the stomach for periods varying up to thirteen days and in some cases pass to the hind-gut. They show no tendency to ascend to the cardia. In the case of *H. culicidarum*, though, as with *L. tropica*, fresh human blood rapidly destroys the

flagellates *in vitro*, a feed of human blood does not injure flagellates already in the stomach of the fly. This is due to the rapid destruction of complement in the stomach of the fly. It is clear that the development of the insect and plant flagellates in *P. papatasii* is an illustration of a non-specific behaviour. The observations indicate that the behaviour of *L. tropica* in the fly is no mere accident but an indication of a specific relationship between the fly and the parasite.

C. M. W.

Adler (S.) & Theodor (O.). **The Inoculation of Canine Cutaneous Leishmaniasis into Man and the Behaviour of Various Strains of Leishmania in Mice.**—*Ann. Trop. Med. & Parasit.* 1930. July 8. Vol. 24. No. 2. pp. 197–210. With 5 figs. on 2 plates. [6 refs.] [Microbiol. Inst., Hebrew Univ., Jerusalem.]

Though observers have shown that the inoculation of *Leishmania tropica* into the skin of dogs gives rise to lesions resembling oriental sore, no one has performed the converse experiment by inoculating human beings from the naturally occurring sore of dogs. This the authors have now done with a strain isolated from a dog in Baghdad. A volunteer was inoculated on the left arm at two spots with cultures of the parasite and similarly on the right arm with flagellates from *Phlebotomus papatasii* infected from cultures. Though two papules developed at the spots inoculated with flagellates from the flies, no parasites could be discovered in them and they had disappeared in five to six weeks. On the left arm, however, two papules were observed after about six weeks and shortly after this parasites were demonstrated in the lesions. The result was unexpected, for the authors have failed on several occasions to produce oriental sore in human beings with cultures of *L. tropica* from human cases, but have succeeded with the same flagellates which had established themselves in *P. papatasii*. They have likewise succeeded with flagellates from naturally infected flies and from flies fed on oriental sore cases. The experiment proves that the oriental sore of dogs in Baghdad is caused by the same parasite as that producing the disease in man. A dog was infected in both ears by cultures of a Palestinian strain of *L. tropica* and by the same strain passed through *P. papatasii*. Before inoculation into the dog the strain had the following history: recovered from a naturally infected fly in Jericho—inoculated into one human being and then into another—cultures—inoculated into a mouse—cultures. Histologically one of the papules which developed on the left arm of the volunteer resembled naturally occurring oriental sore of man.

The Baghdad dog strain of *L. tropica* failed to infect the tails of mice, whereas cultures of visceral canine leishmaniasis obtained from Nicolle in Tunis readily produced infections. A human strain from a case of infantile kala azar in Naples also failed to produce lesions in mice, though the Palestine strain of *L. tropica* and the Tunis strain referred to above both gave rise to visceral and cutaneous infections after intraperitoneal inoculation. Though the Baghdad dog strain failed at first to infect mice, after the successful injection of the volunteer cultures obtained from one of the lesions were found to be slightly infective to mice. Mice were successfully infected with a South American strain, and one animal in addition to the lesions at the site of inoculation in the tail developed secondary lesions at the nape of the neck, thus demonstrating the conveyance of parasites by the blood stream from one site

to another. As a result of these somewhat conflicting experiments the authors advise caution in drawing conclusions as to the identity or difference of parasites. The Baghdad dog strain was found to behave in *P. papatasii* like *L. tropica* from man, though the infection rate was lower and there was a tendency for it to die out in about nine days. The flagellates ascend the cardia, attach themselves to the rhabdorium and enter the pharynx in large numbers.

C. M. W.

Adler (S.) & Theodor (O.). **Infection of *Phlebotomus perniciosus* Newstead with *Leishmania infantum*.** [Correspondence.]—*Nature*. 1930. Sept. 20. Vol. 126. No. 3177. p. 437.

The authors record experiments conducted in Catania with *Phlebotomus papatasii* and *P. perniciosus* in their relation to infantile kala azar. Both these flies had been infected by feeding on hamsters infected with the local strain of *Leishmania donovani*. There was a marked difference, however, in the percentages which became infected. Of 18 *P. perniciosus* 15 were positive, while of 123 *P. papatasii*, which moreover ingests a larger volume of blood, only one was positive. In both flies the flagellates tended to assume an anterior position, but in the case of *P. perniciosus* at a temperature of 29° C. to 30° C. flagellates were found in the pharynx three and a half days after feeding. *P. papatasii* was also infected by feeding on human bone marrow, but no infection occurred if smears of the material showed less than one parasite per 40 fields (Oc. 4 Obj. $\frac{1}{12}$). By culture methods parasites have been demonstrated in the blood of almost 100 per cent. of cases of infantile kala azar, but a concentration of parasites in the blood giving one parasite per 40 fields has never been seen. It is concluded that *P. papatasii* can be excluded as an important vector, while *P. perniciosus*, which gives a high infection rate after the ingestion of relatively few parasites, should be considered as a good carrier of kala azar in Italy.

C. M. W.

Blanc (Georges) & Caminopetros (J.). Sensibilité du spermophile de Macédoine (*Citillus citillus*) au kala-azar méditerranéen. [**Susceptibility of the Macedonian Spermophile to Mediterranean K.A.**]—*C.R. Acad. Sci.* 1930. Nov. 3. Vol. 191. No. 18. pp. 800–802.

The authors have discovered that the Macedonian spermophile (*Citillus citillus*) is very susceptible to kala azar whether of human or canine origin. Infection takes place very readily after inoculation by the cutaneous, subcutaneous, subconjunctival, intraperitoneal, intratesticular or intrahepatic routes of cultures or parasites from the spleen of human cases or the organs of experimental animals. The animals live from one to five months. In fifteen days the spleen and liver are rich in parasites, which can also be found in the circulating blood. On the death of the animal parasites can be found in the blood and in all the organs, including the healthy and ulcerated areas of the skin. On section of the organs the general microscopic appearance is that of masses of heavily parasitized macrophages in the vicinity of the vessels —a picture of a veritable blockage of the reticulo-endothelial system with leishmania. Inoculated with the parasite of oriental sore the animals do not develop a generalized infection. It is pointed out that

as the blood of infected animals is rich in parasites, blood-sucking arthropods can be infected. It is noted that infections have been produced by the subcutaneous inoculation with crushed arthropods several days after they had fed on infected animals.

This small marmot of Greece, which is as susceptible to kala azar as the guineapig to tuberculosis, lives in large colonies upon dry ground near water and close to fields of cereals. It is abundant in Eastern Macedonia from Salonika to Florina, is easily kept in captivity, and should become a useful laboratory animal.

C. M. W.

Gupta (B. M. Das). **The Diagnosis of Kala-Azar by Culture of the Peripheral Blood.**—*Indian Med. Gaz.* 1930. Sept. Vol. 65. No. 9. pp. 489–492. [10 refs.]

In 1914 Row pointed out that successful cultures of leishmania from the peripheral blood of cases of kala azar could be obtained by removing blood from a vein, diluting it with several volumes of citrated saline solution, centrifuging and inoculating tubes of N.N.N. medium with the cellular deposit. By following this technique with the modification of allowing the cells to sediment in the cool incubator instead of centrifuging the author has cultivated flagellates from 95·9 per cent. of 169 cases of untreated kala azar. The average number of days for the appearance of flagellates is 11·4. On two occasions tubes examined on the tenth day showed only motile bacilli which were identified as *Bact. typhosum* and *Bact. paratyphosum* A. On another occasion both leishmania and *Bact. paratyphosum* B were present. It is thus seen that organisms of the typhoid group can grow in N.N.N. medium at a temperature of 22° C. As regards treated cases of kala azar, in most the parasites disappear from the peripheral blood after the first injection.

C. M. W.

Paradiso (F.). Sulla diagnosi di leishmaniosi interna infantile mediante culture dal sangue periferico e dal midollo osseo. [**Diagnosis of Infantile Kala Azar by Culture of Blood and Bone Marrow.**]—*Policlinico.* Sez. Med. 1930. Oct. 1. Vol. 37. No. 10. pp. 494–500. [34 refs.] [Inst. of Clin. Pediatrics, Univ., Catania.]

The author records the successful culture of leishmania from the peripheral blood of all of 15 cases of infantile kala azar in Catania. The medium employed was the semi-solid one adopted by Adler and Theodor for the cultivation of these organisms. Each tube was inoculated with one to three drops of blood and flagellates were found after 11 to 30 days' incubation at 22° C. The uniformly positive results obtained show that the method is of diagnostic value.

C. M. W.

Burowa (L. F.) & Moltschanow (S. A.). Einfluss der Röntgenstralen auf die Kulturen von Leishmania. [**Influence of X Rays on Cultures of Leishmania.**]—*Pensée Méd. d' Usbéquistane et de Turquménistane.* Tashkent. 1930. Apr.–May. No. 7/8. pp. 47–57. With 3 text figs. [29 refs.] [In Russian script. German summary p. 124.]

Exposing cultures of *Leishmania tropica* and *L. donovani* to Röntgen rays, the authors find that the two strains are equally susceptible and are rapidly destroyed by a dose of 75 per cent. to 100 per cent. H E D. Röntgen rays cannot be regarded as in any way specific as a therapeutic

agent since antimony preparations destroy the flagellates even more quickly; nevertheless such therapeutic results as follow the use of the rays in cutaneous and visceral leishmaniasis are probably due to their destructive action on the parasites.

C. M. W.

Row (R.). **On a Simple Solidified Haemoglobinised Saline Agar Medium suitable for Surface Cultures of Leishmania and Allied Flagellates.**—*Indian Med. Gaz.* 1930. June. Vol. 65. No. 6. pp. 319–320. With 3 text figs. [3 refs.] [Grant Med. College, Bombay.]

In order to overcome the difficulties associated with the culture of leishmania on the surface of solid media in Petri dishes, the author has devised a method for carrying this out in wide test tubes, one inch in diameter.

In each tube place 6 cc. of an ordinary 3 per cent. agar in normal saline. When required the agar is melted and to each tube is added an equal volume of haemoglobinized saline [see *B.M.J.*, 1912, May 18, p. 1119]. After mixture, the tubes are sloped and when the medium is solid it is incubated in the upright position at 37° C. for some hours and then in the ice box. The liquid of condensation is then removed carefully with a pipette and kept sterile for subsequent use. The tubes are left with the surface of the medium uppermost in order to obtain a dry surface, which is then inoculated at some distance from the bottom with a drop or two of culture. The tubes are again left till the surface appears dry, after which 1 to 2 cc. of the condensation fluid are introduced into the bottom of the tube, care being taken not to moisten the surface of the medium. The tubes are then incubated in the slanting position with the surface downwards. By this method the rich cultures which are obtained in the Petri dish are secured without difficulty.

C. M. W.

Chodukin (N. J.) & Sofieff (M. S.). Zur Frage der Identität von *Leishmania donovani* und *Leishmania canis*. [**The Question of Identity of** *L. donovani* **and** *L. canis*.]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1930. July. Vol. 34. No. 7. pp. 369–382. [15 refs.]

The paper describes serological investigations with leishmania from human and canine cutaneous and visceral infections. They were undertaken to determine the possibility of distinguishing the strains serologically. Rabbits and mice were immunized by injections of cultures and their sera were tested by the adhesion reaction, microscopic and macroscopic agglutination and the effect they had on the growth of the organisms in cultures. The conclusion reached is that the identification of leishmania by serological reactions is not so simple as some observers have supposed, for each strain isolated may have features of its own.

C. M. W.

Boyd (T. C.) & Bose (B. K.). **The Ultra-Violet Absorption Spectra of Sera in Tropical Diseases, Kala Azar.**—*Indian Jl. Med. Res.* 1930. July. Vol. 18. No. 1. pp. 267–272. With 5 figs. (2 on 1 plate). [Med. College, Calcutta.]

The absorption spectra of blood sera in the ultra-violet region having been systematically studied by Judd Lewis,* the authors were led to

* *Proc. Roy. Soc.* B.89, 1916, 327.

compare his results with the serum of kala azar cases. As regards normal sera, the results obtained were almost identical with those of Judd Lewis. For kala azar sera the absorption curve was distinctly different from the normal. This was due not only to a difference in the concentration of the total protein of the serum, but probably also to some change in the nature of the proteins or to some change in their relative amounts.

C. M. W.

GHARPURÉ (P. V.). **Chopra's Antimony Test in a Non-Endemic Kala-Azar Area.**—*Indian Med. Gaz.* 1930. July. Vol. 65. No. 7. pp. 389–390. [Grant Med. College, Bombay.]

CHOPRA's antimony test for kala azar was applied by the finger-prick method (this *Bulletin*, Vol. 27, p. 616) to a series of 266 cases in an area in the Bombay Presidency which is free from kala azar. In a 1 in 5 dilution 5 cases, and in a 1 in 10 dilution 2 cases were positive. The serum test was carried out with 199 sera, chiefly those sent for the Wassermann reaction. With undiluted sera 19·6 per cent. were positive and with 1 in 5 dilution 1 per cent.

C. M. W.

PIKUL (J.). Ein Fall von Hämoglobinurie bei viszeraler Leishmaniose. [**Haemoglobinuria in a Case of Visceral Leishmaniasis.**]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1930. July. Vol. 34. No. 7. pp. 358–360.

The case is that of a female child three years of age who was suffering from visceral leishmaniasis contracted in Tashkent. Between June 10th and August 16th, 1928, seventeen injections of antimosan were given. After an interval of three weeks treatment with stibosan was commenced, eighteen injections being given between September 1st and December 1st. During this period there was no improvement, the child suffering twice from pneumonia and once from an enterocolitis simulating dysentery. Treatment with antimosan was recommenced on December 8th with an intravenous injection of the same dose as that given at the commencement. In three to five minutes after the injection there was pain over the kidneys, convulsions and rigor. The pupils were dilated, the pulse was thread-like and rapid and the general condition semi-comatose. In fifteen to twenty minutes 150 cc. of wine-coloured urine was passed. A few minutes before the injection the urine had been normal. The rigors and convulsions lasted for an hour, while the temperature rose to 40·5° C. Urine was passed frequently and in small quantities, the colour gradually changing to normal during the course of 16 hours. By the evening the condition was improved though the temperature was 40·6° C. On the following day there was slight jaundice, while the urine contained albumen and casts. Though no further specific treatment was given a gradual improvement set in, so that 2½ months after the attack of haemoglobinuria complete recovery from the leishmania infection had taken place.

C. M. W.

CARONIA (G.). **The Therapy of Internal Leishmaniasis.**—*Amer. Jl. Trop. Med.* 1930. July. Vol. 10. No. 4. pp. 261–281. [3 refs.] [George Williams Hooper Foundation for Med. Research, Univ. of California, San Francisco.]

The author reviews the progress of the treatment of kala azar to the time of the introduction of tartar emetic by himself and DI CRISTINA in 1915. He is convinced that tartar emetic remains the best remedy for the disease when it is possible to administer it intravenously. He does not think that better results are obtained with the more recently

introduced organic antimony compounds. When, especially in children, it is not possible to give tartar emetic intravenously stibenyl administered intramuscularly is the best substitute. It can be injected into the gluteal muscles in a dose of 5 to 10 cgm. for infants, 10 to 15 cgm. for other children, and 15 to 20 cgm. for adults at intervals of two or more days. It gives a moderate local infiltration and quite insignificant general symptoms. It can bring about recovery, but more slowly than antimony tartrate, and may provoke antimony resistance and tolerance.

C. M. W.

Timpano (P.). Un caso di kala-azar guarito con la splenectomia. [**Case of K.A. cured by Splenectomy.**]—*Policlinico.* Sez. Prat. 1930. Nov. 24. Vol. 37. No. 47. pp. 1710–1711. [14 refs.]

The case referred to is that of a child five years of age. As the condition became worse in spite of treatment with tartar emetic splenectomy was performed. After the operation the fever quickly subsided and rapid improvement followed. Two months later the child was in good condition and was discharged as cured. The author thinks that the operation should be performed in cases which do not respond to treatment.

C. M. W.

Parrot (L.), Donatien (A.) & Lestoquard (F.). Sur le développement du parasite de la leishmaniose canine viscérale chez *Phlebotomus major* var. *perniciosus* Newstead. [**Development of the Parasite of Canine Kala Azar in** *P. major* **var.** *perniciosus.*]—*Bull. Soc. Path. Exot.* 1930. July 9. Vol. 23. No. 7. pp. 724–726. [1 ref.] [Pasteur Inst. of Algeria, Algiers.]

A dog suffering from kala azar and manifesting numerous secondary skin lesions was housed in a separate compartment of the kennels at the Pasteur Institute of Algiers. Each morning the compartment was examined for *Phlebotomus perniciosus*, the only species to be found there. The engorged females were captured and kept in a humid atmosphere for dissection one or more days later. In 4 of 53 specimens thus examined on the third day numerous leptomonas were found in the stomach. Up to the present the flagellates have not been found in any other part of the intestine. There can be no doubt that the flagellates had their origin in the leishmania infection of the dog, and as the sand-flies feed as readily on man as they do on the dog the danger to public health of infected dogs, particularly those with skin lesions which are common in Algiers, is evident.

C. M. W.

Rampon (L.). La leishmaniose canine à Bouira (dépt. d'Alger). [**Canine Kala Azar at Bouira (Algiers).**]—*Rev. Vét. et Jl. de Méd. Vét.* 1930. Sept. Vol. 82. pp. 502–506.

A case of kala azar in a child having occurred at Bouira in Algeria the canine disease was looked for, with the result that 12 cases were discovered during the four months July to October 1929. The author gives a clinical account of the disease in the dog. Treatment consists in injecting intravenously a 1 per cent. solution of tartar emetic on alternate days till four injections have been given. After a week's

interval in most cases it is necessary to give another course, which may have to be followed by one or two further ones. According to the weight of the animal the dose is 1 to 3 cc. for the first two injections and 3 to 5 cc. for the subsequent ones.

C. M. W.

Mills (E. A.) & Machattie (C.) in collaboration with Chadwick (C. R.). **The Histopathology of Oriental Sore with Special Reference to its Natural Occurrence in the Dog.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1930. June 30. Vol. 24. No. 1. pp. 67–74. With 48 figs. on 4 plates.

Canine oriental sore in Baghdad commences as a deeply seated nodule detected only on palpation. Later the nodule is superficial and later still ulceration occurs. The parasites appear to be inserted first into the deep tissues of the dermis at a depth corresponding with the length of the proboscis of a sandfly. There follows a local concentration of macrophages which gradually extend in the dermis, particularly towards the skin surface. Perivascular infiltration with plasma cells is a marked feature of the lesion. Each macroscopic nodule usually results from the fusion of several microscopic masses. Ulceration is the result of upward pressure and coagulation necrosis of the thinned epidermis. Before ulceration occurs polynuclear leucocytes are rarely present. In well-developed lesions there is slow degeneration of leishmania in older cells while those more peripherally situated are healthy in appearance.

C. M. W.

Portugal (Hildebrando). Contribución al estudio de la histopatología de la leishmaniosis tegumentaria cutánea. [**Histopathology of Dermal Leishmaniasis.**]—*5a Reunión Soc. Argentina Patol. Regional del Norte, Jujuy, 7 al 10 Octubre, 1929.* Vol. 1. pp. 549–560. With 3 text figs. [21 refs.] [Lab. of Dermat. Clinics, Faculty of Med., Rio de Janeiro.]

The author has studied the histopathology of cutaneous leishmaniasis in Brazil. He divides the cases into ulcerating and non-ulcerating. The former are subdivided into ecthematoid and frankly ulcerating types and the latter into framboesial and verrucosal types. He gives a brief review of previous work on the subject, describes the main features of his own cases, and concludes that disagreement amongst histologists can be accounted for by the fact that the exact histological picture changes with the course of the disease.

C. M. W.

Muir (E.). **The Differential Diagnosis of Leprosy and Dermal Leishmaniasis.**—*Indian Med. Gaz.* 1930. May. Vol. 65. No. 5. pp. 257–258. With 3 text figs. [2 refs.]

The author calls attention to the possibility of mistaking post kala azar dermal leishmaniasis for leprosy. This is particularly true of two types of the leishmaniasis, namely, that with depigmented skin areas and the nodular or xanthoma type. The history of previous kala azar and the discovery of leishmania in the lesions should prevent an error in

diagnosis. During the first ten months of 1929 nine such cases appeared at the leprosy clinic in Calcutta. It seems probable that in many other endemic areas of kala azar, patients are being treated for leprosy instead of for dermal leishmaniasis which yields to antimony treatment.

C. M. W.

Agronick (M.). Die Hautleishmaniosis in Russland. [**Dermal Leishmaniasis in Russia.**]—*Arch. f. Dermat. u. Syph.* 1930. May 27. Vol. 160. p. 126.

The wide distribution of oriental sore in Turkestan and Transcaspia has led one Russian author to suggest that the disease is hereditary. In the years 1923 and 1924 there were registered from four divisions of the Turkoman Republic 965 and 916 cases respectively. An examination of 1,216 persons in factories, schools, etc., in Merv showed that 761 either had oriental sore or had recovered from it. In three cases the author obtained a cure with preparations of bismuth.

C. M. W.

Bernasconi (Vicente). Consideraciones sobre el censo de leishmaniosis. [**A Census of Leishmaniasis.**]—*5a Reunión Soc. Argentina Patol. Regional del Norte, Jujuy, 7 al 10 Octubre, 1929.* Vol. 1. pp. 561–573.

In order to obtain information regarding the distribution of cutaneous leishmaniasis in Northern Argentina medical men were requested to send in returns of cases which came under their notice. This census has resulted in a record of 381 cases which were distributed as follows :— Salta 253, Jujuy 119, Tucumán 2, Santiago del Estero 3, Bolivia 4. It is fully realized that these figures in no way give a correct idea of the extent of the disease.

C. M. W.

Revue de Médecine et d'Hygiène Tropicales. 1930. Sept.–Oct. Vol. 22. No. 5. pp. 209–232. Le bouton d'Orient. [**Oriental Sore.**]—1°. Petite chronique [Trabaud (J.)]. pp. 209–210. 2°. "Leishmaniose cutanée" ou "bouton d'Orient" (Salek) à Alexandrie d'Egypte [Panayotatou (Angélique)]. pp. 211–220. With 5 text figs. [9 refs.] 3°. Notes cliniques sur le bouton d'Alep [Chevalier (G.)]. pp. 221–228. 4°. Le bouton d'Orient à Damas [El Khani]. pp. 229–232.

The series of papers on oriental sore in Alexandria, Aleppo and Damascus is preceded by a foreword by the first author. The second author describes her experiences of the disease in Alexandria and mentions 5 cases previously described (this *Bulletin*, Vol. 21, p. 259 and Vol. 26, p. 328) together with 4 recorded for the first time. One of these had already been reported as a case of kala azar (this *Bulletin*, Vol. 27, p. 614) but it is now noted that the child had previously suffered from oriental sore. The third author discusses the disease in Aleppo, giving figures of age and sex incidence, location and number of lesions and duration of the disease, based on 671 cases. The fourth author states that 10 years

ago, apart from imported cases from Aleppo and Baghdad, Damascus was free from oriental sore but that since then the disease has gradually established itself.

C. M. W.

DUPONT (Adolphe). Un cas de bouton d'orient à structure de sarcoïde de Boeck. [**Oriental Sore with the Structure of Boeck's Sarcoid.**]—*Ann. de Dermat. et de Syphil.* 1930. May. 7 Ser. Vol. 1. No. 5. pp. 453–461. With 4 figs. [6 refs.]

Examining sections of an excised oriental sore in the pre-ulcerative stage the author was struck by the resemblance to the condition known as the sarcoid of Boeck. The sore examined showed in the deeper parts of the corium circumscribed masses of cells, the majority of which were epitheloid in nature. These masses were separated from one another by unaltered dermal tissue. At one point the epidermis was much reduced in thickness, the cells being separated by exudate in which lymphocytes occurred. The presence of numerous parasites, free in the superficial exudate and intracellular in the deeper parts, and the thinning of the epidermis, evidently a preliminary to ulceration, served to distinguish the condition from that of Boeck.

C. M. W.

NAPIER (L. Everard) & GUPTA (C. R. Das). **A Clinical Study of Post-Kala-Azar Dermal Leishmaniasis.**—*Indian Med. Gaz.* 1930. May. Vol. 65. No. 5. pp. 249–257. With 3 graphs & 10 figs. on 4 plates. [6 refs.] [School of Trop. Med. & Hyg., Calcutta.]

Since the publication of the paper by ACTON and NAPIER in 1927 on 44 cases of post-kala azar dermal leishmaniasis (this *Bulletin*, Vol. 25, p. 70) notes of a further 150 cases have been collected. The present paper is a clinical study of these cases. The condition occurs in all classes of the community, in persons of all ages and both sexes. Though not all give a history of having suffered from kala azar, and some deny having had any illness which might have been this disease, it is concluded that the condition is a sequela of generalized leishmania infection. The dermal lesions usually make their appearance from one to two years after all signs of the visceral infection have disappeared. In no cases have the lesions developed during the primary generalized infection, but in three instances there was a relapse of the visceral disease when the dermal condition developed. The skin eruption appears as depigmented areas, erythema or butterfly rash and nodules. More rarely it is of the verrucose, papillomatous or xanthoma type, while at other times there is a hypertrophy of the lips, eyelids, alae nasi. The depigmented patches, the first lesions to appear, occur on the body or face about one year after the kala azar attack. On the face, but rarely on the body, they pass on to the nodular stage, which is reached about a year later. On the face the erythema may also be regarded as a first stage of the disease. The xanthoma stage would appear to be the final outcome of the condition, but it is rarely seen, and then in cases giving a history of ten to thirty years.

C. M. W.

NAPIER (L. Everard) & HALDAR (K. C.). **The Treatment of Post-Kala-Azar Dermal Leishmaniasis.**—*Indian Med. Gaz.* 1930. July. Vol. 65. No. 7. pp. 371–375. With 3 text figs. [2 refs.] [School of Trop. Med. & Hyg., Calcutta.]

Of 150 cases of post-kala azar dermal leishmaniasis seen at the Calcutta School of Tropical Medicine between October 1927 and March 1930, 82 attended for treatment. Various treatments, both local and general, were tried, with the result that it was found that the only satisfactory method is the intravenous injection of one of the pentavalent antimony compounds which are efficacious in the treatment of kala azar. In the series reported aminostiburea was employed. The 23 patients who were completely cured received a mean total dose of 5 gm. and a mean number of injections of 26·7 during a mean period of 123·1 days.

C. M. W.

THEODORE (J. H.). **Note on a Case of "Dermal Leishmanoid" from Madras.**—*Indian Med. Gaz.* 1930. Sept. Vol. 65. No. 9. p. 508. With 2 text figs. [King Inst. of Preventive Med., Guindy.]

The paper describes the first cases of dermal leishmanoid from Madras. A year previously the patient had suffered from a fever diagnosed clinically as typhoid. Whether this was actually kala azar or not cannot be stated, but when seen by the author there was no sign of this disease. Three years before the patient suffered from typhoid, his brother who was living with him was successfully treated for kala azar.

C. M. W.

PHOTINOS (Georg Th.). Die Behandlung der Orientbeule durch lokale Injektionen mit Emetinum hydrochloricum. [**Treatment of Oriental Sore by Topical Injections of Emetine.**]—*Dermat. Woch.* 1930. Aug. 9. Vol. 91. No. 32. pp. 1219–1223.

The author, who was the first (1918) to treat oriental sore by injections of emetine hydrochloride, states that since his first announcement the method has been adopted in Greece, and particularly in Crete, with the most gratifying results. He describes his technique, which consists in injecting a solution of the drug into the tissue beneath the sore, the needle of the syringe being inserted into the healthy skin and passed through the tissues. The solution is injected, the needle being gradually withdrawn at the same time. If the injection is successful the skin round the sore will become red. If there is not a complete red area surrounding the sore, the injection is repeated at other spots till this condition is attained. The author states that tubes of emetine solution containing from 0·01 to 0·10 cc. can be purchased. [Presumably he refers to a 1 per cent. solution.] The choice of the tube to use depends on the size of the sore or the number when they are multiple. According to the age of the patient the quantity injected at one time varies from 0·01 to 0·12 cc. If the quantity is not sufficient to deal with the whole of a large sore or many sores, then injections are given on successive days, care being taken not to give more than 0·90 to 1·0 gm. of the drug in the entire course. When a cure is not obtained in 15 to 20 days the treatment is repeated. In the majority of cases the injection of 0·01 to 0·05 cc. at one sitting is sufficient.

C. M. W.

Ziemann (Hans) & Waegner (Alfred). Ueber einen bemerkenswerten Fall von Haut Leishmaniosis aus Ostafrika. [**A Remarkable Case of Dermal Leishmaniasis from East Africa.**] *Arch. f. Schiff.- u. Trop.-Hyg.* 1930. July. Vol. 34. No. 7. pp. 345–351. With 7 text figs.

The paper describes a remarkably severe case of cutaneous leishmaniasis in a planter from Portuguese East Africa. In April 1927 the skin on the outer side of the right knee was damaged as a result of a fall into a hole in the ground. In two weeks' time there was suppuration, darkening of the skin and extension of the wound. In spite of treatment the patient became steadily worse till in June 1928, when he returned to Europe, there were large ulcers above and below the knee on the outer side of the right leg, which was considerably atrophied and flexed from the extensive scarring. Treatment was of no avail till at the end of September 1928 leishmania were found at the edge of the ulcers and treatment with stibenyl was instituted. To this drug administered intravenously the patient was peculiarly susceptible, for immediately after the first injection of 0·1 gm. there was discomfort in the throat, vomiting, violent diarrhoea, retention of urine, severe cyanosis and collapse. On the following day albumen and casts were present in the urine. Stibenyl in a dose of 0·01 gm. in 5 cc. of water was then given intramuscularly. The reaction was less severe and it was possible gradually to increase the dose to 0·3 gm. though after each there were cramp-like pains in the leg at the site of injection. The lesions commenced to heal so that at the beginning of December there remained but two small areas still uncovered by skin.

C. M. W.

Gasperini (Carlo Gasperino). Allergia nel Bottone d'Oriente. [**Allergy in Oriental Sore.**] *Ann. d'Igiene.* 1930. June. Vol. 40. No. 6. pp. 432–437. With 1 text fig.

A boy 12 years of age contracted oriental sore in Mersina (Asia Minor). There was an ulcer in front of the left ear which finally healed without inconveniencing the patient. Meanwhile another sore in the same position on the other side of the face developed. Though smaller than the first, the second sore produced subjective symptoms of irritation and intolerance which the author attributes to a condition of allergy produced by the first sore.

C. M. W.

Gonzalez (Hernan E.), Ontaneda (Luis E.) & Vidaurreta (Manuel). Leishmaniosis cutánea no ulcerada. [**Non-Ulcerative Dermal Leishmaniasis.**] *5a Reunión Soc. Argentina Patol. Regional del Norte, Jujuy, 7 al 10 Octubre, 1929.* Vol. 1. pp. 605–613. With 10 figs.

A description of a case of cutaneous leishmaniasis in which there was marked enlargement of the left foot as a result of extensive lesions of the verrucose type. A complete cure resulted from injections of tartar emetic.

C. M. W.

Borzone (Rodolfo A.). Caso estacionario de leishmaniosis tegumentaria americana observado en Santa Fe. [**Chronic Case of Dermal Leishmaniasis seen at Santa Fé.**] *5a Reunión Soc. Argentina Patol. Regional del Norte, Jujuy, 7 al 10 Octubre, 1929.* Vol. 1. pp. 600–604. With 6 text figs. [Inst. of Microbiol., Hyg. & Regional Path., Santa Fé.]

The case was one of mucocutaneous leishmaniasis of at least 5 years' duration, during which period the lesions had remained stationary in spite of various treatments. The condition was diagnosed by the discovery of parasites in the lesions of the mucosa and the skin. An emulsion of flagellates

from a culture obtained from the case was killed by exposure to a temperature of 37° C. for two days. This was injected into the skin, where it produced a definite reaction which could not be obtained in a number of other skin diseases employed as controls.

C. M. W.

Arias Aranda (Carlos). Foco familiar de leishmaniosis tegumentaria americana. [**Family Infection of Dermal American Leishmaniasis.**]—*5a Reunión Soc. Argentina Patol. Regional del Norte, Jujuy, 7 al 10 Octubre, 1929.* Vol. 1. pp. 590–594. With 6 text figs.

A record of the almost simultaneous occurrence of three cases of cutaneous leishmaniasis in three members of one family—a woman and her two children. Two of the cases, which were all severe, were completely cured, while the third had considerably improved at the time of writing. The drugs employed were stibenyl, tartar emetic and neosalvarsan.

C. M. W.

Chacon (Arnoldo Lachner). **Leishmania tropica—a Case Report.**—*Eighteenth Ann. Rep. Med. Dept. United Fruit Company, Boston, Mass.* 1929. pp. 175–176. With 1 text fig. [United Fruit Co. Hosp., Limon, Costa Rica.]

The patient, a West Indian negro labourer of Costa Rica, who presented two large ulcers on the face, stated that these had commenced twenty days before as two small abscesses. Leishmania were found in smears and a cure was effected by the use of tartar emetic intravenously and various local applications.

C. M. W.

Silva (Flaviano). Leishmanioses des organes génitaux. [**Leishmaniasis of the Genitalia.**]—*Ann. Dermat. et Syph.* 1929. Sept. 6th Ser. Vol. 10. No. 9. pp. 965–972. With 2 figs. [32 refs.]

The author describes three cases of South American leishmaniasis in which the penis and scrotum were involved. In one case the patient gave a definite history of the disease having first appeared at a wound in the thigh inflicted by a thorn which was extracted with some difficulty.

C. M. W.

Bernasconi (Vicente). Leishmaniosis y sífilis. [**Leishmaniasis and Syphilis.**]—*5a Reunión Soc. Argentina Patol. Regional del Norte, Jujuy, 7 al 10 Octubre, 1929.* Vol. 1. pp. 598–599.

The Wassermann reaction according to the techniques of Wassermann, Hecht and Meinicke was tested in fifty-five cases of cutaneous leishmaniasis diagnosed by the discovery of parasites. In 11 cases the reaction was positive with the three techniques and in 18 it was negative. In the others one or other of the techniques gave a negative or doubtful result.

C. M. W.

Gupta (B. M. Das). **On the Differentiation of *Leishmania tropica* from the Parasite of Dermal Leishmanoid.**—*Indian Jl. Med. Res.* 1930. July. Vol. 18. No. 1. pp. 105–108. With 3 figs. on 1 plate. [6 refs.]

Various tests have been applied by the author to cultures of *Leishmania tropica*, and the Leishmania from dermal leishmanoid. Injected

intraperitoneally into mice both strains gave rise to visceral infections, but the one from the oriental sore gave in addition a nodule in the skin at the site of inoculation. On blood agar plates the oriental sore strain did not produce lateral growths as has been described, but was more luxuriant than the other. It was also more resistant to higher temperatures. All these features indicate that the parasite of dermal leishmanoid differs from that of oriental sore.

C. M. W.

Schüffner (W.). **Kala Azar.**—*Nederl. Tijdschr. v. Geneesk.* 1930. Sept. 27. 74th Year. 2nd Half. No. 39. pp. 4756–4764. With 2 figs. on 1 plate. [3 refs.]

A short account of kala azar and the theories regarding its method of transmission.

C. M. W.

Lazaro Caballero (Rudesindo) & Pastor Botija (Felix). Un caso de kala-azar infantil en la provincia de Huesca. [**Case of Infantile K.A. in the Province of Huesca.**]—*Medicina Países Cálidos.* Madrid. 1930. Sept. Vol. 3. No. 5. pp. 453–455. With 2 text figs. & 3 charts.

A case of kala azar in northern Spain in a child 3 years of age.

C. M. W.

Herrero Rubio (Pedro). Sobre un caso de kala-azar infantil. [**Case of Infantile K.A.**]—*Medicina Países Cálidos.* Madrid. 1930. Sept. Vol. 3. No. 5. pp. 456-460. With 2 text figs.

A case of kala azar in a boy 4 years of age at Alicante, Spain.

C. M. W.

Lucca (Alfredo). Il primo caso accertato di leishmaniosi infantile a Torino. [**First Case of Infantile K.A. diagnosed at Turin.**]—*Pediatria.* 1930. Oct. 15. Vol. 38. No. 20. pp. 1122–1133. [28 refs.] [Inst. of Clin. Pediatrics, Univ., Torino.]

A record of a case of infantile kala azar in Turin. It is described as the first case in this town though the disease was contracted near Cannes.

C. M. W.

Milio (Giulio). Ricerche sulla velocità di sedimentazione delle emazie nella leishmaniosi e sul comportamento di essa durante la terapia specifica. [**Rate of Sedimentation of Red Cells in Kala Azar.**]—*Pediatria.* 1930. Sept. 1. Vol. 38. No. 17. pp. 937–942. [Inst. of Clin. Pediatrics, Univ., Messina.]

The rate of sedimentation of the red blood corpuscles is increased in kala azar. It is related to the number of corpuscles present in the blood and diminishes as response to specific treatment takes place.

C. M. W.

Sen (Amulya Kumar). **The Value of Eosinophilia in the Treatment of Kala-Azar.**—*Calcutta Med. Jl.* 1930. Oct. Vol. 25. No. 4. pp. 160–166.

The author gives short notes of fifteen cases of kala azar in order to substantiate his claim that cases with an eosinophilia, or those which develop

this condition during the course of antimony treatment, have a better chance of recovery than others.

C. M. W.

CHODUKIN (N. J.). Ueber die Kinder- und Hundeleishmaniosis. [**Leishmaniasis of Child and Dogs.**]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1930. Aug. Vol. 34. No. 8. pp. 423–429. [Uzbekistan San. Bact. Inst., Tashkent.]

This paper appears to be a German summary of papers previously published (see this *Bulletin*, Vol. 27, pp. 98 and 620).

C. M. W.

NUDELMAN (Mauricio). Distribución de algunos casos de leishmaniosis tegumentaria en el Chaco. [**Dermal Leishmaniasis in the Argentine Chaco.**]—*5a Reunión Soc. Argentina Patol. Regional del Norte, Jujuy, 7 al 10 Octubre, 1929.* Vol. 1. pp. 574–589. With 16 text figs.

An illustrated account of 12 cases of cutaneous leishmaniasis seen by the author in the Argentine Chaco.

C. M. W.

MAZZA (Salvador) & LUNA (J. D.). Sobre una forma forunculosa no común de leishmaniosis cutánea en dos niños. [**A Furuncular Form of Dermal Leishmaniasis in Children.**]—*5a Reunión Soc. Argentina Patol. Regional del Norte, Jujuy, 7 al 10 Octubre, 1929.* Vol. 1. pp. 595–597. With 1 text fig.

Two children were brought to hospital with furunculous lesions. On examination of the discharge of pus were found gram positive diplococci together with leishmania.

C. M. W.

SILVA (Flaviano) & DE ARAUJO (Eduardo). Leishmaniose experimental. (Nota prévia.) [**Experimental Leishmaniasis.**]—*Brasil-Medico.* 1930. Sept. 6. Vol. 44. No. 36. pp. 997–999. [13 refs.]

A record of the successful transmission of S. American leishmaniasis to a monkey (*Macacus rhesus*) by intradermic inoculation on the nose. A review of previous records is given.

C. M. W.

GUERRICCHIO (Antonio). Il bottone d'Oriente in provincia di Matera (Basilicata). [**Oriental Sore in Matera (Southern Italy).**]—*Arch. Ital. Sci. Med. Colon.* 1930. Apr. 1. Vol. 11. No. 4. pp. 197–200. With 3 text figs. English summary (3 lines). [Vittorio Emanuele III Hosp., Matera.]

A description of two cases of oriental sore, the first to be recorded from the district of Matera in Southern Italy.

C. M. W.

SARKAR (S. L.). **A Case of Dermal Leishmaniasis mistaken for Leprosy.**—*Indian Med. Gaz.* 1930. Oct. Vol. 65. No. 10. p. 572. With 1 text fig.

An account of a case of nodular post-kala-azar dermal leishmaniasis in a patient who was admitted to hospital on the supposition that he was suffering from leprosy.

C. M. W.

REVIEWS AND NOTICES.

BOYD (Mark F.). **An Introduction to Malariology.**—pp. xiv+437. With 82 figs. (2 coloured). 1930. Cambridge, Mass. Harvard University Press. [25s.]

This work consists, in the main, of notes which the author collected from books and articles dealing with malaria, for the benefit of those attending a course of instruction in Rio de Janeiro during 1925, and it will doubtless prove a valuable book of reference. It has the fault of most compilations that not all the pieces fit into a smooth mosaic, and the reader will often want to ask the author's advice as to which he should choose and which he should discard. It is very difficult to keep a book of this kind up to date : for example, on page 260, it is stated that " All available data on mosquito breeding in saline water were recently reviewed by Balfour," but the review referred to appeared as long ago as 1921. The book deals chiefly with the investigations which should be made before the initiation of schemes for the control of malaria ; it is not concerned with the means of preventing it ; barely a page is given to drainage, and no reference is made to bonification or Paris green. (Gambusia is mentioned on one page, but the reader is left in doubt as to whether it is a plant or an animal, because it is not included in the section on Predaceous Vertebrates.) The identification of anopheline species is not dealt with, and for the systematic study of these the reader is referred to a list of 40 or 50 books and papers on pp. 383–5. The symptoms and treatment of malaria naturally find no place in a work of this nature, but the effect of quinine on the exogenous cycle is discussed ; plasmoquine, however, is not mentioned.

The four principal chapters of the book are :—

(1) The Natural History of Malaria. The first half of this deals with man as the source of infection, with his immunity, relapses, and so on. The second half deals with the anopheline vectors—their abundance and their range of flight—and also with the principal factors concerned in the prevalence of malaria.

(2) Malaria Surveys. This is concerned with the epidemiology of malaria. The use of Poisson's formula is explained under the heading of sampling, and a useful table of sampling limits, from PEARL, is included. The various systems of measuring enlarged spleens are discussed ; the author considers that CHRISTOPHERS' method is the most accurate, but that it is too elaborate to be useful. Instructions on the making and staining of blood-films are given : it is unlikely that everyone will adopt the use of " a sharp-pointed steel pen, one of the nibs of which is broken off " which is recommended as a convenient lancet for pricking the skin. A business-like and convenient system of card-indexing is described. The data for inquiry are printed on the cards and a hole is punched opposite each positive result.

(3) The Natural History of Anophelines. This deals with the geographical distribution of anophelines, and with their general morphology and ecology.

(4) Anopheline Surveys. This is the most interesting part of the book, probably because it is less of a compilation.

Some of the illustrations, such as that of the stomach of an infected *quadrimaculatus*, are good ; others, such as that of its salivary glands, four pages later, are not so good. The printing is excellent.

William Fletcher.

JOHANNESSOHN (Fritz) [Dr. Med.]. **Chinin in der Allgemeinpraxis unter Berücksichtigung pharmakologischer Befunde.** [Quinine in General Practice.]—232 pp. With 3 figs. on 2 plates. 1930. Amsterdam-W. Bureau tot Bevordering van het Kinine-Gebruik. [Price not stated.]

This book is issued by the " Bureau tot Bevordering van het Kinine-Gebruik " in Amsterdam. It is an example of the modern elaborate methods of propaganda, in this case on behalf of quinine. At first glance the attention is arrested by the word " Chininum " boldly emblazoned across the red cover ; the name of the author is modestly introduced inside. It is essentially a compilation and a painstaking one. The book, as its title states, is intended for medical men in general practice, but the practitioner will miss a judicial summing up of the great mass of evidence collected in support of the use of quinine in a great variety of morbid conditions. The medical man in general practice will wish to know the diseases in which, after full investigation and clinical trial, quinine has been found to be of real use with complete details of the best methods of administration. The arrangement of the subject matter is not very satisfactory ; for example, in one part the use of quinine as a hair wash is mentioned, whilst in a different section it is stated that a quinine hair wash produced eczema of the scalp ; it would have been convenient for the reader if the two statements had been closely associated.

The therapeutic uses of quinidine are discussed shortly. They are chiefly its application in various morbid conditions of the heart: paroxysmal tachycardia, auricular fibrillation, coronary sclerosis and thrombosis.

A full bibliography and a subject index are given. The names of authors are recorded without initials.

As a fairly complete compilation of the uses of quinine in the treatment of a long list of diseases this book may have its value, but as a practical guide to the medical practitioner its value is somewhat doubtful.

E. D. W. Greig.

HIGOUMENAKIS (Georges) [Chef du service dermatovénéréologique à l'hôpital Evangelismos (Athènes)]. **Le bouton d'Orient (leishmaniose cutanée) et son traitement moderne.** [Oriental Sore and its Modern Treatment.] Avec préface du Dr. Milian.—pp. vi + 152. With 51 text figs. 1930. Paris : Masson et Cie, 120 Boulevard Saint-Germain. [25 fr.]

The author is chief of the dermatological section of the Evangelismos Hospital at Athens. He is evidently more of a clinician than a parasitologist for though he gives a good general account of oriental sore the value of the book is chiefly on its clinical side. After an historical sketch he describes the distribution and incidence of the disease, the parasite and the histology of the lesions, but when dealing with transmission fails to mention recent work with sandflies and inclines towards the view that the organism is transferred mechanically by house flies and other insects from sores to abrasions and wounds. He discusses the typical sore and the course of its development and continues with an account of 17 atypical forms. This leads him to chapters on prognosis and prophylaxis and finally to one on treatment, the subject with which he is most familiar and which appears to have been the stimulus which led him to write the book. After discussing various methods, including the local injection of emetine, as advocated by his teacher Professor PHOTINOS, he puts them all aside in favour of his own method of diathermy which has given him the best results. This is carried out with high frequency current operating through two electrodes, one a large one applied to the body and the other a small one about the size of a pin's head. The latter, which is the

active electrode, is moved about the surface of the sore and the marginal skin, previously anaesthetized by injection of novocaine, for five minutes till complete coagulation has occurred. On the following day the white coagulum has changed to a black crust. The cure has occurred immediately after the application of current, for live parasites no longer exist. In place of the oriental sore is a wound which heals as rapidly as any aseptic traumatic ulceration. In a final section notes are given of 33 cases, many of them illustrated by excellent photographs and the majority of them treated by the author's method.

C. M. Wenyon.

ROCKEFELLER FOUNDATION. **Annual Report 1929** [MASON (Max), President].—402 pp. With numerous illustrations. New York: 61 Broadway.

In many countries there are rich men who devote part of their wealth to the benefit of their fellow creatures, but there are few whose benefactions reach out over such a world-wide area as do those of the Rockefeller Foundation. It will not be possible, in a short review, to mention all the channels through which help and money flow. Those readers who wish for full details should consult the " Financial Summary " drawn up by the Secretary. It covers nine pages and deals with millions of dollars. Under the head of " Public Health Education " the Report mentions the help which was given to the building of the London School of Hygiene and Tropical Medicine, the annual maintenance of which is provided by the British Government. Institutes of Hygiene have been completed in Prague, Budapest, Angora and at the Peiping Union Medical College, in China, and in connexion with Peiping a health centre has been established at Kiaochow. In the islands of the South Pacific a school has been established for native students at Suva, Fiji. These students will later on be active in public health work. With aid from the " Foundation " an experimental health unit began work on March 1st, 1929, in Mysore, India. These are a few examples of the way in which the Rockefeller Foundation helps to found hospitals and schools of hygiene. Separate sections describe the work done on yellow fever, malaria control work and hookworm surveys in many parts of the world. Every effort is made to educate the people and to introduce good treatment and sanitary appliances, such as suitable latrines in the case of hookworm areas. The " Foundation " provides studentships and fellowships in American and other Universities and helps to make possible interchange of Professors of different countries. It further devotes attention to oriental studies in Baghdad and Jerusalem, to classical studies and has supplied aid to certain scholars in France for the completion of important historical researches. This brief outline may arouse interest in the Report itself. It is well worth reading. The photographs with which the Report is illustrated are very useful and the book contains an excellent index.

J. H. Tull Walsh.

BUCHANAN (R. E.) [Ph.D., Professor of Bacteriology, Iowa State College] & FULMER (Ellis I.) [Ph.D., Professor of Biophysical Chemistry, Iowa State College]. **Physiology and Biochemistry of Bacteria. Volume 2. Effects of Environment upon Micro-Organisms.**—pp. xvii+709. With 57 text figs. 1930. **Volume 3. Effects of Micro-Organisms upon Environment. Fermentative and Other Changes produced.**—pp. xv+575. With 2 text figs. 1930. London: Baillière, Tindall & Cox, 8, Henrietta Street, Covent Garden, W.C.2. [34s. each vol.]

This book is reviewed in *Bulletin of Hygiene*, Vol. 6, p. 119.